

# Contents February 1920

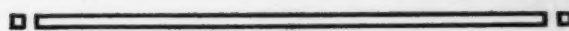


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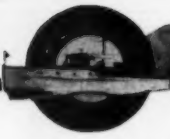
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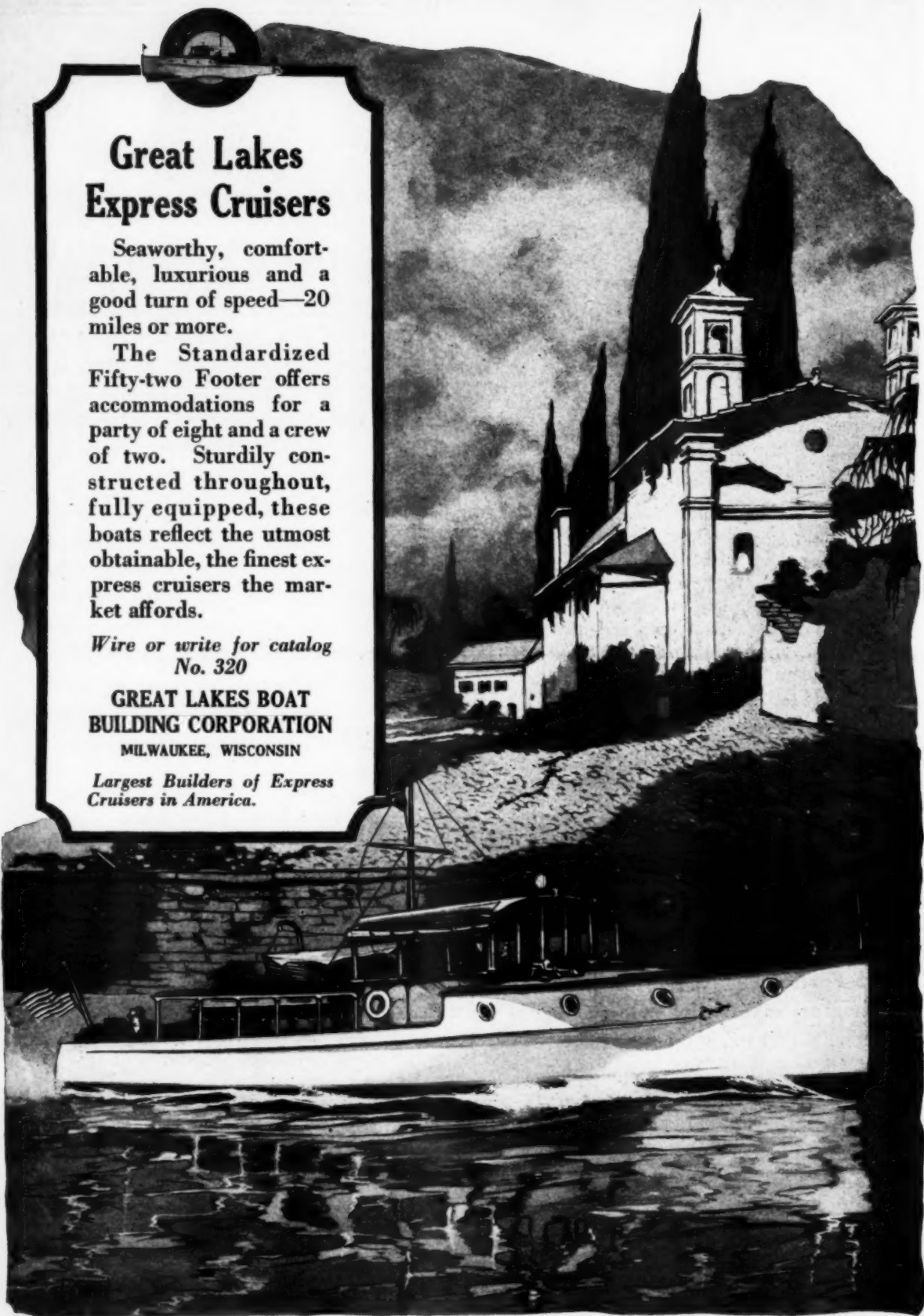
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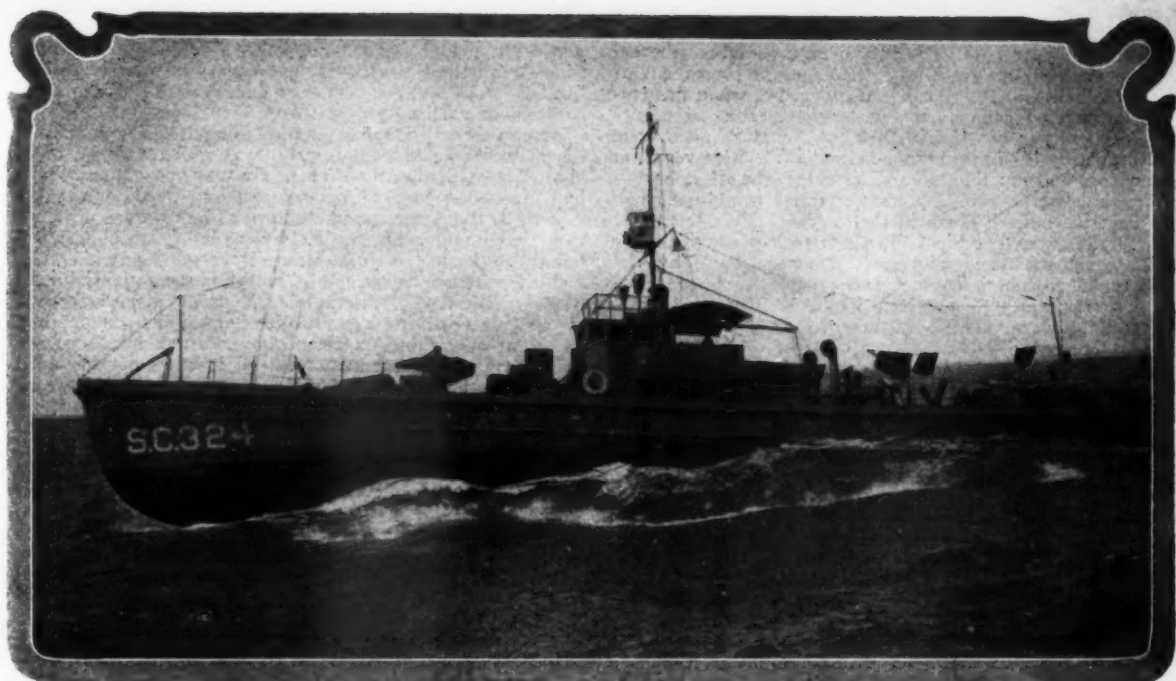
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## What's Her Speed?

Some Interesting Comments on the Speeds Attained by the Famous 110's; For Home Consumption, and Also, Just What Their Abilities in This Direction Amounted to

*By Alfred F. Loomis*

**T**HE first question asked of a motor boat owner is, "How fast can she go?" and the answer invariably comes within three knots of the developed speed—generally more, but sometimes, through ignorance, less.

When this question was asked, however, of officers and men of the submarine chaser force they mentally estimated the gullibility of their interrogator and answered with any figure that came most readily to mind—like 10 knots, or  $34\frac{1}{2}$  miles per hour. As a result of this artless mendacity, information on the actual speed of the motor boat submarine fighters has been veiled in mystery. But I should like to rend the veil here and now by saying that any fully equipped chaser in Uncle Sam's Navy that logged 20 knots in one hour (or sixty minutes) had wind, tide, and greased lightning working for her.

During the days of the war everyone in the service was strictly enjoined from divulging the speed of any naval vessel, but it was not humanly possible for the entire personnel to keep quiet on this interesting topic, and many, I suppose, concluded that it was better to mention any incorrect figure than to maintain perfect silence when the question was put. When the Adriatic chasers arrived at the British island of Malta en route to Corfu they were the first American

vessels that had stopped there in nearly five years and were for that reason and for their odd appearance the objects of general curiosity. The island was suspected of being honey-

combed with German spies, so we were warned again not to talk of speed or of any other chaser feature while on liberty. But a friend of mine had been ashore only a short time when a native photographer told him that three of the boys in response to his questions had given the chaser speed as 25, 28, and 33 knots. If the Maltese had been seeking positive information from my friend by this indirect means he must have been disappointed, for he was told that the sailor who had mentioned 33 knots had accidentally transposed his figures. Even a Maltese would have been capable of deducing that the reverse of 33 is 33, and of concluding that somebody had spoofed him.

The much vaunted spy system of the Teutons fell down when it came to determining the rate of progress that a chaser maintained in the water, and it is doubtful whether the Huns ever received the desired information in time for it to be of service to them. After the cessation of hostilities, and before the Italians began to mix it up with the Jugo-Slavs in the Adriatic—at a time, that is, when the Dalmatian coast was a comparatively peaceful locality—the chaser



*Bow view from Crow's Nest showing a few spare drums of gasoline*

men did a little curio hunting in the ex-Austrian fleet and one of them annexed a copy of the Austrian naval year book for the year 1918. The information contained therein was surprisingly accurate as to tonnage and armament of the capital ships of the American Navy, but when in turnings its pages I came to the paragraph pertaining to the "Motorboote für die U-bootsjagd," I found that someone had drawn on his imagination. I copied the item verbatim in my log, and am thus able to give the gist of it here—although as we are still in a state of war I would not be so offensive as to set it down in the original. Translated, the information was that the United States had completed or under construction several vessels 50 meters long powered with two Duesenberg engines and capable of 30 miles an hour; 300 others 33½ meters in length with a speed of 28 miles, and several more 10.7 meters long and of 24-mile speed.

The contributor of this valuable and authentic information to the Austrian naval bible may possibly have had the oil-burning Ford Eagles in mind when he referred to the vessels 50 meters (or 164 feet) in length; but if so there seems to have been nothing accomplished in the interest of truth by powering them with Duesenberg engines. The purpose served by crediting us with several U-boat hunters of 10.7 meters (or 35 feet) is also obscure; but it is quite evident that the third class of boats (those of 33½ meters, or 109.9 feet length) were the 110-footers. The total number, 300, was approximately right, and the length was correct, but the speed of 28 miles was about 90 per cent too much.

bases, the ex-Austrians who were permitted to inspect the powerful little motor boats made a bee-line for the Y-guns and depth charge racks. They asked few questions because they already had inside information about American TNT, but they stood and gazed at the ash cans with a fine mixture of dread and relief on their faces.

Some such expression illumined the grizzled countenance of an ex-Austrian captain who was given passage on a chaser from Spalato to Fiume. He was one of many who had joined the Jugo-Slav movement and were accepted as friends by the Americans, and he was likewise one of a multitude who found that the Italians would go to almost any length to keep the Jugo-Slavs from getting what they wanted, whether it was food, liberty, or the right to happiness. In the case of the captain, they blocked his efforts to secure transportation by rail to his home. The commanding officer of a certain American chaser which had been ordered to Fiume thereupon received instructions from his superior to take the Austrian along. The hostile attitude of the Italians upon his arrival in Fiume concerns us less here than the practical joke played upon him en route by the commanding officers of the subchaser.

This youthful skipper, knowing the erroneous impression which the Austrians had gained of chaser speed, arranged with his black gang a set of engine telegraph signals that differed slightly from the usual method of ringing the bells. The chief difference was that when the engine-room force received Slow ahead they were to understand that the signal meant the fastest speed of which the engines were capa-



*Strange were the ways of transporting gasoline. Here is a ten man-power propelled lighter bringing drums of gasoline to the chaser fleet in Malta*

Yet it was accepted as gospel by the Austrians and must have been instrumental in increasing the respect which they entertained for the submarine chasers.

As to the opinion of the chasers which the Austrians held it may be remarked parenthetically that after three weeks of the American patrol at the mouth of the Adriatic, none of their submarines attempted to pass the barrage. Those of us who can recite the first verse of our national anthem will recall the lines running

"... the bombs bursting in air,  
Gave proof through the night that our flag was still there."

The chasers gave the same proof, except that their bombs burst in the water. So many of them burst there that the subs preferred the seclusion of their home naval bases. After the armistice, when the chasers penetrated these

ble. When the august passenger stepped on the bridge of the little war vessel and announced his readiness to depart, the C. O. cast off his lines and got under way on his center motor. The dial on the chart-house indicator pointed to Slow, but the boat soon worked up to her speed on one motor—about seven knots. When she was clear of the harbor traffic, the commander rang up Slow on the two wing motors and the speed jumped up to 16 knots.

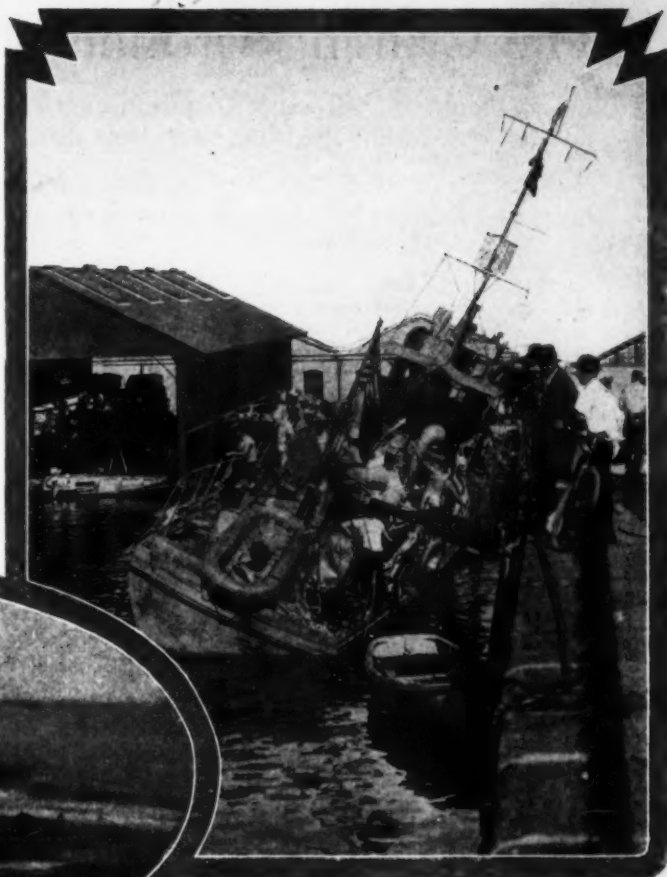
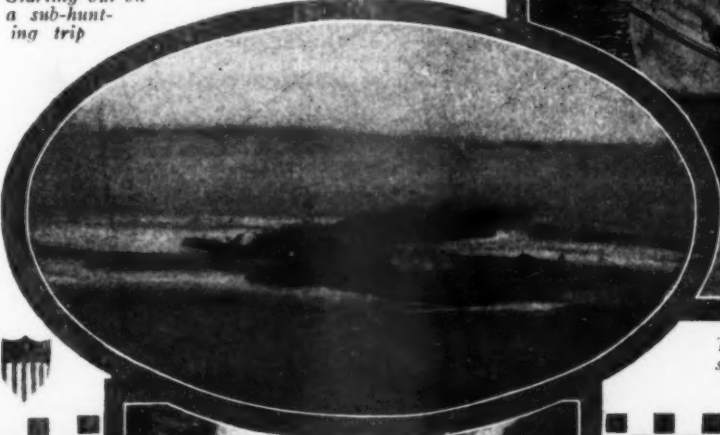
Now when a chaser traveled at this rate she cut quite a figure, with a wide bow wave tumbling away on each side, steam vapor flying up from her exhaust ports, and a boiling wake curling up to her stern. The ex-Austrian noticed the commotion in the water, felt the stir of mechanical life under him, and glanced through the chart-house window at the engine telegraph. What he saw was "Slow ahead" on three engines, and he looked twice to be sure that his eyes

hadn't deceived him. Then he pursed up his lips into a noiseless whistle and, so to speak, wrapped himself in silence; but it was generally thought by those who observed him that he spent some moments in calculating how much chance an Austrian sub had against a chaser that could cover 500 yards in sixty seconds at slow speed and erupt the water with a ton of TNT in that time.

With some of the chaser people speed was a hobby, but often it was slow speed that interested them the most. They could show something unusual if the S. O. P. gave the signal "Anchor at discretion," and it was a case of arriving first at the anchorage and getting the choice of positions or of arriving last and rowing a half mile to shore; but in ordinary cruising formation they preferred to lag behind position. Their excuse was that high speed wore down the engines quickly, but they could never explain the advantage of falling back a hundred yards and from that point maintaining the speed of the convoy.

One skipper permitted a chronic disinclination to run his motors at anything faster than half speed to overcome his dislike for a towline, and accepted a tow from a destroyer for the better

Starting out on a sub-hunting trip



The chasers did not confine their rolling to the sea. This one rolled off at a marine railway



Prominent in this stern view from above is the famous Y gun for distributing "ash cans"

part of a two-days' run between two ports in the Mediterranean. There was nothing crude about his method of taking a tow; that is, he didn't send a quartermaster aloft with the message, "You are going too fast for me; slow down or pass me a line." No, he plugged along at our 11-knot rate until a slight derangement developed in one of his circulating pumps, and then he signalled that he would be obliged to fall back a few minutes for repairs. It was approaching dusk and the destroyer captain, to whom 11 knots was a snail's pace, had no mind to cut down his revolutions further for a disabled chaser, so passed a towing hawser and ordered the chaser to hang on until repairs were completed.

In the morning when I went on deck for an eight o'clock sight the skipper of the disabled chaser could be seen through the glass drinking coffee on his bridge in a carefree, yachtish way, casting his eye in every direction but the sun's. The sea was like glass, steering was child's play, and as a seven-inch hawser with two steam turbines on the other end was carrying him to his destination more surely than his own engines could do, navigation seemed a useless performance. Down in the engine-room, it was to be inferred, the black gang still wrestled with a refractory circulating system, anxious to complete repairs and proceed once more under gasoline power, but on deck life progressed like a pleasant dream. In a few minutes, however, this peaceful rhapsody was rudely jarred by a message from the destroyer which the rest of us overread—as one might call eaves dropping in signals—

(Continued on page 176)



# The Cruising Ground of the North West

A Picturesque Group of Islands in Puget Sound, Offer Many Attractions for the Motor Boat Cruiser Who Seeks New Exploration Grounds

By Monroe Woolley

Photos by J. A. McCormick

**T**HE St. Lawrence has its Thousand Islands; Puget Sound has its hundreds.

On the Sound the islands come bigger in size, but in smaller bunches. There are exactly 172 islands in the San Juan group, an archipelago we won by arbitration from England, with a German kaiser as the referee.

The San Juan archipelago, as has been noted by those fortunate enough to go there for an outing, is not over-run with tourists in the same way that Yellowstone, Yosemite, the Grand Canyon, and other similar wonders, are partitioned, chiefly because of its isolation. You don't have to wire in advance for hotel accommodations; and automobile accidents, as a result of an over-abundance of cars on the road, are not to be feared. On the other hand, no region remote from rails is more worthy the little time and trouble required to get there.

Nature has made some marvelous natural monuments in her sculpture studios in the archipelago. The most striking

specimen of these, perhaps, is the huge rock carved by wind and water to an identical likeness of George Washington. Native islanders in their enthusiasm like to have you believe that the great commonwealth in which they live got its name of Washington through this natural statue to the father of our country.

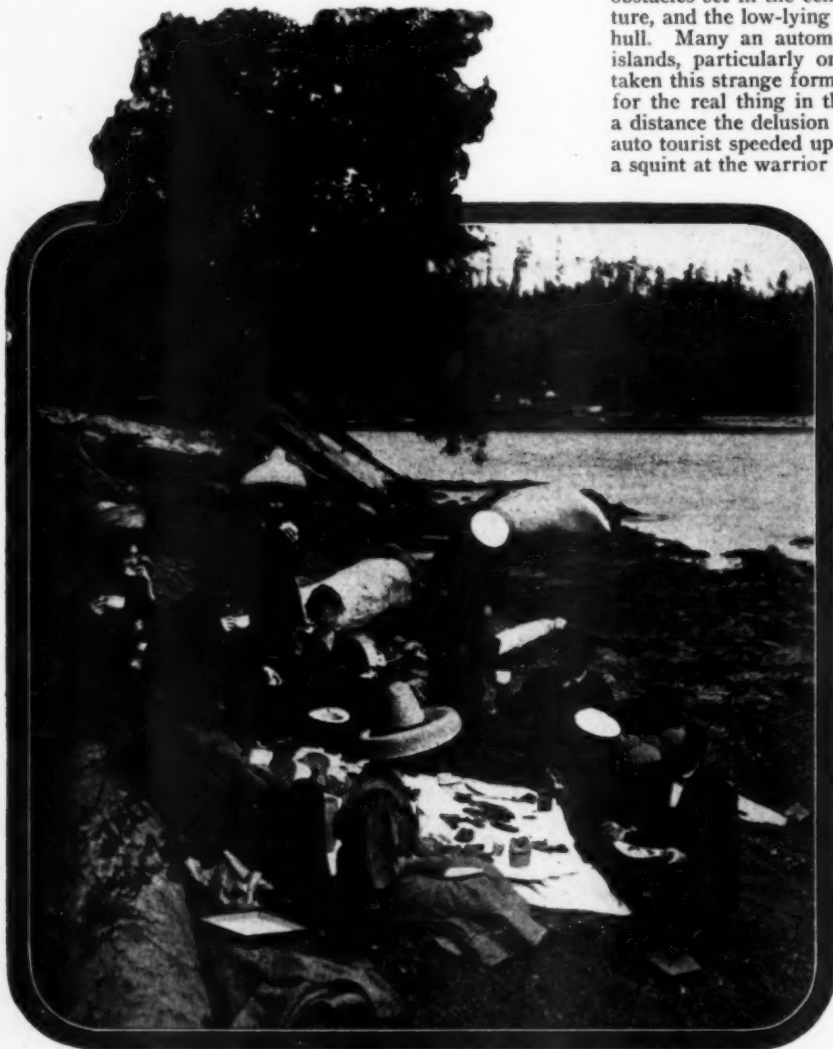
"Battleship Island" is nature's masterpiece of the San Juan group. You get an idea of just what it is like from its name. "Battleship," as in the case of the object you want to photograph, must be in proper focus to get the image perfectly fixed on the ground glass in the human eye. Viewed from adjacent islands "Battleship" remarkably resembles a dreadnaught riding at anchor in the waters of the Sound, an American dreadnaught with appropriate caged masts at that!

A lonesome looking fir tree, scant of branches, sticking up at either end of this most unusual island formation, forms the delusion as to the caged masts; brush and other obstacles set in the center form the funnel and superstructure, and the low-lying land outlines a perfect and graceful hull. Many an automobile tourist riding on neighboring islands, particularly on Whidby Island, nearby, has mistaken this strange formation of rock and soil and plant life for the real thing in the fighting ship line. Viewed from a distance the delusion is complete, and on one occasion an auto tourist speeded up his machine to get to the beach for a squint at the warrior before it might, as he supposed, pass out of sight down the Sound.

The San Juan Islands form what is known as San Juan County, Washington. To the southwest lies Island County, composed only of two or three islands as against San Juan's 172. San Juan, it is believed, has the distinction of being the largest county in the country, if not in the world, made up solely of islands. Thus, Island County appropriated a name which doesn't rightfully belong to it. San Juan County is, furthermore, the most northwesterly county in the country.

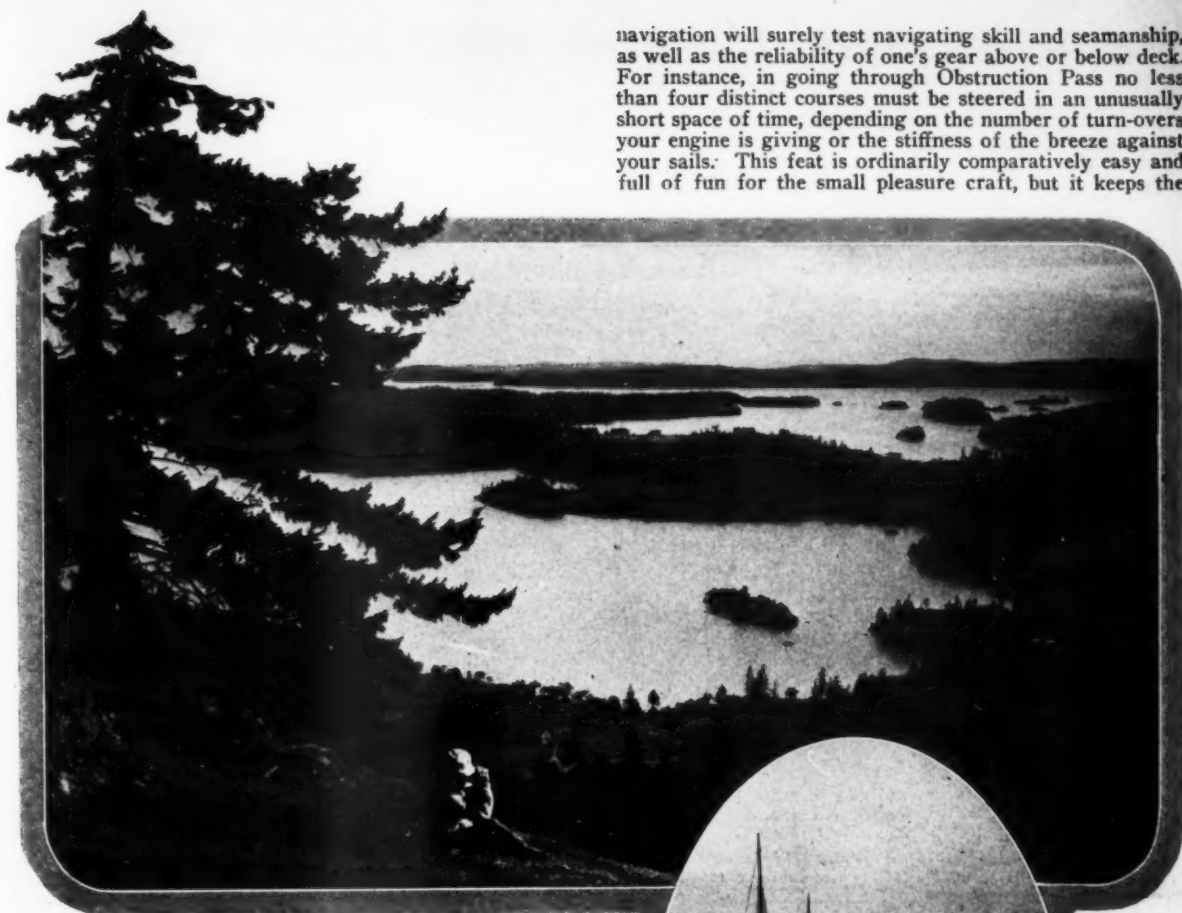
The shores of the islands composing the archipelago are considerably rock bound, but broad, sandy beaches abound now and then. Observed from a steamer the islands look like they might not be able to subsist a goat or a gopher, but the valleys are rich in pasture and agricultural lands. There are a number of hills, or, more properly putting it, "mountainettes." Mt. Constitution is the highest peak; it rises 2,409 feet, and from its summit an unsurpassed view may be had of the entire sound. No visitor thinks of leaving the archipelago without scaling Constitution, any more than a tourist in Honolulu would forego climbing Punch-bowl.

Farm industries are confined mostly to berry growing, fruit production, and dairying. There are extensive sandstone quarries, and a lime works there has a capacity of 1,200 barrels daily. A



Picnicking on the shores of one of the numerous small islands of the San Juan group, Puget Sound

navigation will surely test navigating skill and seamanship, as well as the reliability of one's gear above or below deck. For instance, in going through Obstruction Pass no less than four distinct courses must be steered in an unusually short space of time, depending on the number of turn-overs your engine is giving or the stiffness of the breeze against your sails. This feat is ordinarily comparatively easy and full of fun for the small pleasure craft, but it keeps the



*An unsurpassed view of the entire sound from the summit of Mt. Turtleback, Orcas Island*

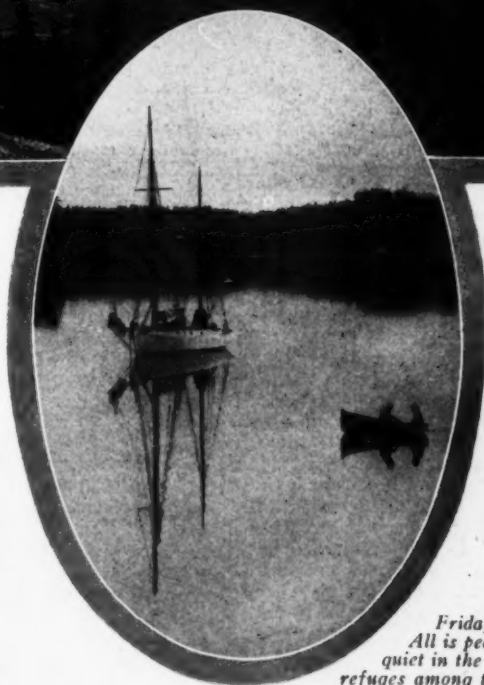
Puget Sound shore line minus a salmon cannery would, indeed, be an oddity. Running true to form, the islands of San Juan are no exception to this rule.

The first gray fish ever canned for food purposes was packed at Friday Harbor at the instance of the Federal Government. Food experts believe they see in the much-despised dogfish an inexpensive and wholesome food. The very name makes this hawk of the seas repulsive for table use, but under another name it takes trout to beat the gray fish for taste. But all reference to the dog must be tabooed from the bill of fare.

Don't for a moment think, however, that the San Juan archipelago is anxious to advertise itself to the world solely as a hive of industry. The county possesses really great natural wealth in the form of scenery, scenery of the miniature model type, not awe-inspiring, and the inhabitants prefer to exploit this valuable asset along with the other things.

The islands are a favorite retreat for Puget Sound yachtsmen, yes, for yachtsmen for hundreds of miles around, even from Canada and Alaska. In season motor and sail yachts are thicker up San Juan way than salmon eggs in a hatchery incubator. There are many little harbors with deep anchorages, almost tiny enough for use as playtoys in a child's nursery. Some of these are large enough only for a few small craft and are fringed with sandy beaches, small firs, ferns, and grass. Annual pilgrimages are made to the islands by the yacht clubs of all the northwest seaport towns, and no cruise is complete with the numerous little harbors of the insular empire omitted from the itinerary.

For the yachtsman who likes to wriggle his way in and out and about canal-like passes the channels of the San Juan and neighboring Sucia islands—really all one group—form a fine and fitting field for this sort of sport. Such



*Friday Harbor. All is peaceful and quiet in the numerous refuges among the islands*

wheelman on a steamer spinning the spokes with as much vim, vigor, and versatility as is required of the pilot of a roulette wheel.

Sportsmen with a fancy for fishing may find fun with seine, hook, rod, or spade in the Sucias and San Juans. Fine, finny fellows, clams, crabs, and shrimp harmonize with twin-six appetites whether the menu is taken at a beach breakfast following a night's camp on shore, at lunch on the after deck while the chugging engine is kicking holes in the water and the bow is cleaving a wake through the blue, or at dinner in the little cabin below when the anchor is down and the "crew" is relieved from deck watches for a day's final feed before all hands begin the inevitable round of yarns that is a part of every night's program while

cruising. The winds may now and then get chilly on the open Sound, but they can't penetrate to the sheltered, land-locked coves and tiny harbors in the Sucias and San Juans.

An enchanting view of the entire Sound, similar to an aviator's panoramic picture, may be had on clear days from the summit of Mt. Constitution on Orcas Island. There is the lofty, snow-capped Olympic range seemingly a stone's throw away on one side, Mt. Baker and the Cascades on the other, while multi-colored Mt. Ranier marks the foot of the shiny, shimmering Sound off toward Tacoma.



*Pilgrimages by yacht clubs and others to the sandy beaches and pay grounds of the many islands are very popular*

The largest islands are San Juan, Orcas, and Lopez. Friday Harbor, the county seat, is the leading town. No great distances separate any of the islands, and often there is just barely passage for a steamer, a motor boat, or yacht to pass between them. There are many little marine mysteries, and hiding places. It was in this archipelago that the juvenile game of hide-and-seek was originally transferred from land to water. Smugglers in past decades found the tangled channels and passes ideal for hiding away from Uncle Sam's revenue cutters when hard chased. Many a pitched battle between these opposing forces was fought in these waters in earlier days, and some interesting stories are told by old pioneers of lawless escapades.

The islands are a popular resort for summer campers of the northwest, and about a dozen hotels,—all of them good,—are operated for the accommodation of tourists. Sea food naturally abounds, probably because choice steaks rarely get farther along than Seattle and the other Sound metropolii. Rock, ling, red, and kelp cod are numerous; shell food, smelt, and salmon are always obtainable, and you may harvest your own crop or get it from the fishermen in the towns.

There are a number of fine, permanent homes on the islands. Among these is Rosario, the costly estate of Robert Moran, a Seattle capitalist, located on Orcas Island. Mr. Moran has harnessed a nearby waterfall to give his home all modern conveniences, and from the mansion a great pipe organ may be heard on festive occasions rendering the strains of the master composers.

The school of marine biology of the University of Washington is located near Friday Harbor. It has an annual attendance in normal times of about one hundred students, in addition to a distinguished faculty. This school brings to the islands representatives of educational

institutions from all over the world. Those who come to study and to learn generally return in later years for delightful outings. In this way "arbitration archipelago", as sometimes the islands are referred to, is constantly adding to its select list of regular visitors, along with the annual yachting crowds. Many important marine discoveries have been made at this school, notably new knowledge about the kelp plant,—ferreted out by a bright American girl,—the seaweed which already promises to keep us from patronizing foreign fertilizer plants when world trade finally resumes its customary operations.

California is going to spend \$100,000 annually to get you to "come out to the United States" when you feel that you must see something besides the pastoral pictures surrounding you in the old home town. It is believed that California is the only state anywhere which levies a tax for the sole purpose of advertising itself. The state law permits counties to levy a tax of two cents on each \$100 of assessed valuation for such purposes. Pretty soon all the states will be doing it; then most all our sight-seeing surplus cash will be spent at home, as it should be.

Since 1914 the west coast and Alaska have never before drawn such crowds of visitors. See America first, and if there's still a bank balance that burdens you it is then time to go abroad. But the hordes, sorrowful to say, which have come west in the past years have hurriedly hustled along to see the big shows, and, in many cases have ignored the side shows. Hundreds, if not thousands, of travelers have blindly passed by the San Juan Islands, their eyes and binoculars, their attentions and intentions, levelled

at some genuine or mythical scenic splendor leagues distant, when at their very feet lay a sprinkling of hill tops sticking up out of the briny blue of Puget Sound yearning for admiration and a baptism of travelers' checks.

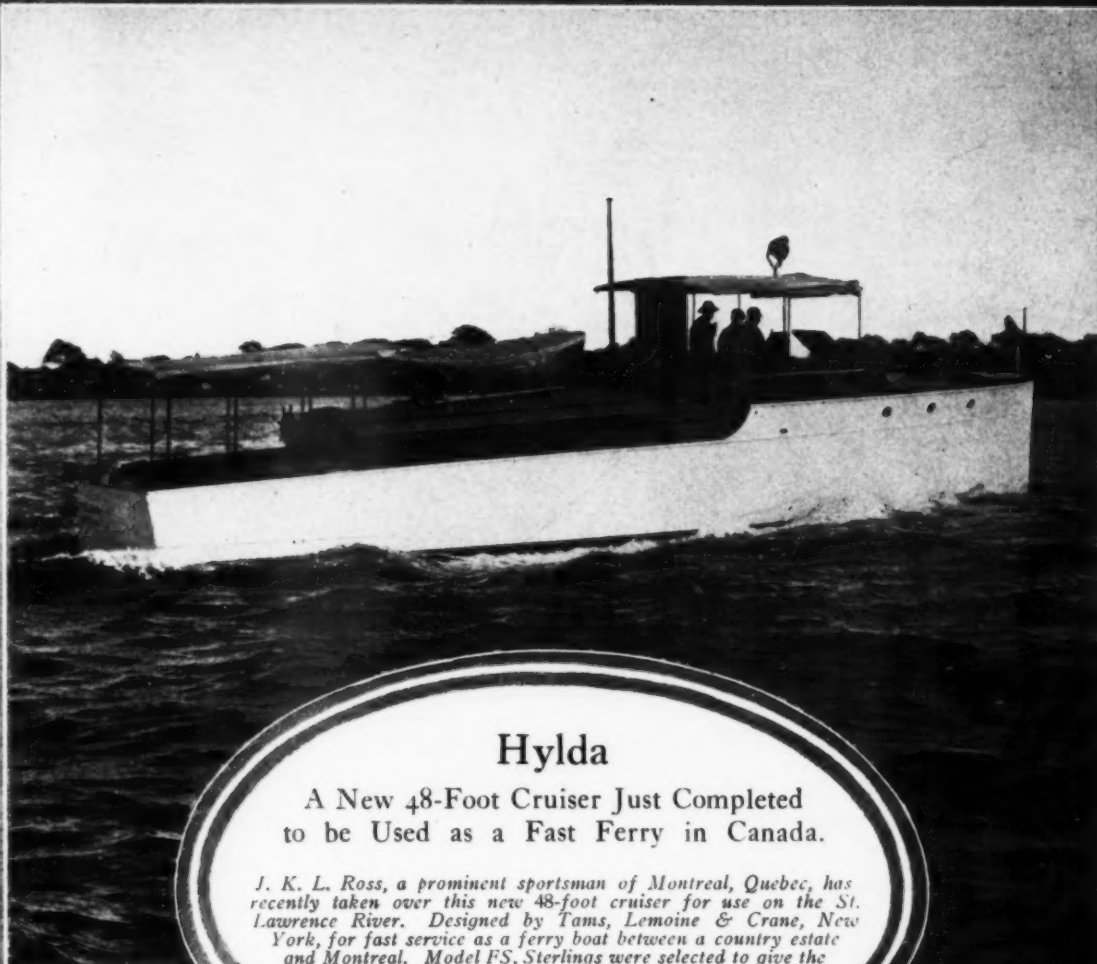
A good way to spend a fortnight in the San Juans and Sucias is to journey to some Puget Sound city by boat or train and charter a motor boat or sailing yacht of small size—that is if you chance to know anything about sailorizing. You can eat and sleep aboard, and go on little cruising jaunts by day.

"What's an archipelago?" the school mistress up in the San Juans asks her hopefuls at recitation. "It's a lot of islands surrounded by water," the hopefuls chorus knowingly. "But what are the San Juans?" is the next query. "An archipelago surrounded by land," comes the answer.



*Commercial boats and work boats congregate in large numbers where the salmon is caught and packed*





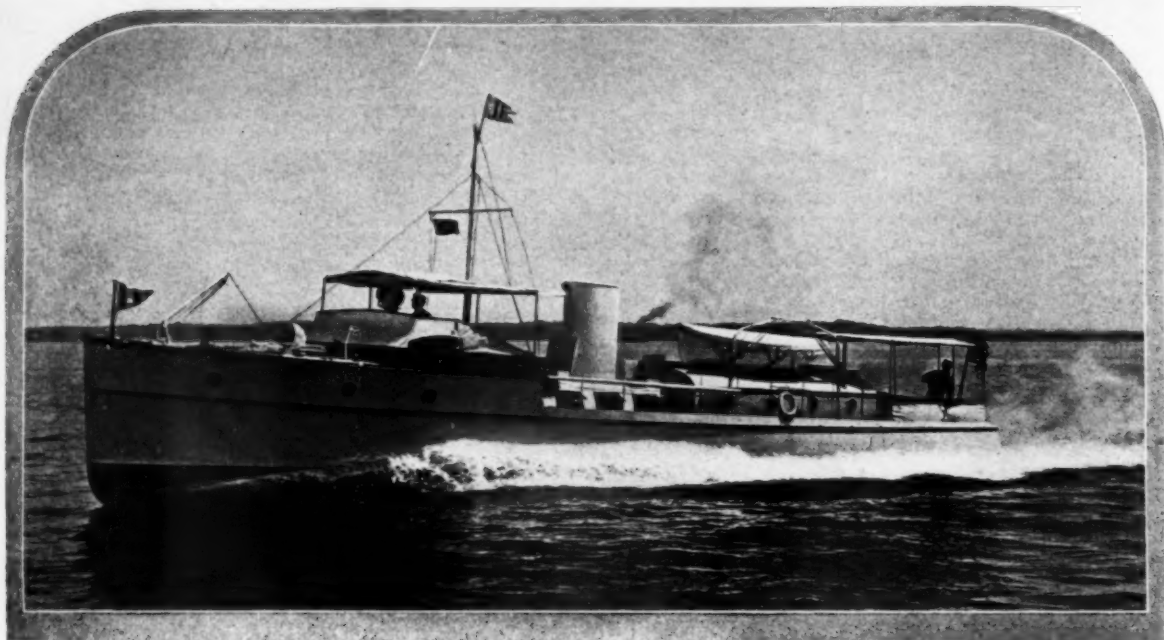
## Hylda

A New 48-Foot Cruiser Just Completed  
to be Used as a Fast Ferry in Canada.

*J. K. L. Ross, a prominent sportsman of Montreal, Quebec, has recently taken over this new 48-foot cruiser for use on the St. Lawrence River. Designed by Tams, Lemoine & Crane, New York, for fast service as a ferry boat between a country estate and Montreal. Model FS, Sterlings were selected to give the required sustained speed of twenty-six miles per hour. The twin Sterlings make a very compact installation, and do not crowd the engine-room at all*



*The engine is located under the bridge deck and provides ample space for the pair of Model FS, six-cylinder Sterlings of 145 h.p. each. Mahogany and white enamel are effectively used in the interior of the saloon*



## Inquirer, a Sensational Express Cruiser

Modern Developments in Gas Engine Practise Make Possible Exceptional High Speeds—  
Murray & Tregurtha Engines in Inquirer Boosted Her Speed from 25 to 34 m. p. h.

**N**OT long ago a speed of 25 m.p.h. was considered to be quite fast. Particularly when applied to boats of a larger size than the small runabout, speeds exceeding 25 miles were considered to be remarkable. Now by the mere operation of changing the power plant, the speed of a large boat can be jumped from 25 to almost 34 miles per hour. It is essential of course that the lines of the underbody are such, that a speed of this kind is possible with the hull. All the power in the world would be of no avail in some boats, as it is not practical to force a boat through the water at a rate greater than its critical speed will allow. Inquirer pictured above is a splendid example of hull with

smooth fast lines. When it was decided to change the power plant not long ago, consideration was given to many factors, but the power plant finally selected was a pair of 400 h.p. Murray & Tregurtha high-speed engines. The progress in power plant improvement has been tremendous both during and subsequent to the war. Under the impulse of these modern high-speed plants boat speeds have gone up by leaps and bounds so that we have today the possibility of driving a large heavy yacht at express train speeds for long sustained periods of time. Inquirer succeeded in traveling a measured mile at a speed of 33.82 m.p.h. Murray & Tregurtha motors turn a pair of 26x32-inch propellers at 1,400 r.p.m.



*Bridge deck and  
control station on  
Inquirer*

*Substantial spray  
cloths afford ample  
protection*

Inquirer was built by the Mathis Yacht Building Corp., Camden, N. J., in 1917, from a design of A. Loring Swasey, but on account of various reasons due to the war and otherwise she has been idle during the past two seasons.

Col. James Elverson, of Philadelphia and New York, has named this boat Inquirer after his famous Philadelphia newspaper of the same name.

The illustrations herewith show that she is not a freak or special racing craft, but a thoroughly staunch and able yacht. Her remarkable speed is therefore all the more noteworthy, as it is distinctly unusual for a boat this size to be capable of such high speeds. Her general dimensions are: length



*Looking aft from bridge; note the ample deck space*

overall, 62 feet; beam, 11 feet 6 inches, and draft 3 feet 9 inches.

The engine-room which houses the big Murray & Tregurtha machines is located fairly well forward. In fact, it is practically amidship, where it can be well lighted and ventilated by windows in the engine-room trunk and the stack above. Aft of the engine-room is the splendidly appointed galley, this occupies the space on the starboard side, while the port side is taken up by a lavatory equipped with toilet and bath together, with all the smaller fittings usually found here. The owner's stateroom and quarters are next in order aft of the galley and are lavishly furnished and fitted. Mahogany trim is used and white enamel lends an air of cheer and brightness. Double berths are provided and furnish comfortable quarters for a night's rest. A mahogany table with drop leaves is used when the saloon is converted to a dining room and the accessibility of the galley makes this arrangement convenient.

Away back in the after deck is found an assortment of wicker chairs and furniture in the observation cockpit. Protected by a big glass windshield all spray and chilly breezes are kept from the occupants of the cozy chairs pictured here.

Auxiliary power for lights, fans and small appliances are furnished by a General Electric auxiliary outfit, which furnishes ample current to take care of every possible demand on it from the numerous electrical devices, which are fitted throughout. The crew is well looked after by commodious quarters forward of the bridge deck, pipe berths and other devices for their comfort being provided.



*Spacious after deck makes a glorious place to sit and take in the scenery*



*Interior of main saloon aft; extremely comfortable quarters for the owner are provided with all possible conveniences*



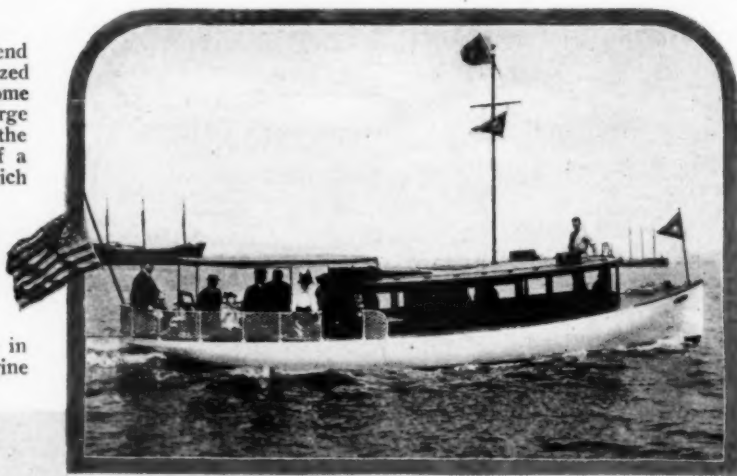
# The Evolution of a Cruiser

Changes in the Requirements of Yachtsmen and Influence of the Racing Rules All Tend to Improve the Cruiser

By F. W. Horenlurger

**S**HORTLY after the Flood when Friend Noah stepped out of the Ark, he realized that it would be necessary to find some means of getting about on the relatively large bodies of water which still covered most of the earth. Accordingly he designed for himself a boat and installed a naphtha engine, with which it was possible to move about.

We, the descendants of Noah, also move about in our motor boats and use instead some form of machine generally called a gasoline motor. The forerunner of the present-day cruiser was of the glass-cabin type, with lots of windows which could be opened and closed similar to those in a trolley car. After a while the gas engine became more popular and reliable with the result that the old naphtha engines were entirely replaced.



*An early type of glass-cabin boat with deck on after end*



*Modified glass cabin type having greater freeboard forward and smaller windows*

Yachtsmen were becoming more venture-some now and stayed out when it blew and stormed. The result was broken windows and a wetting when a sea came aboard over the low forward deck, so it was necessary to overcome this difficulty by increas-

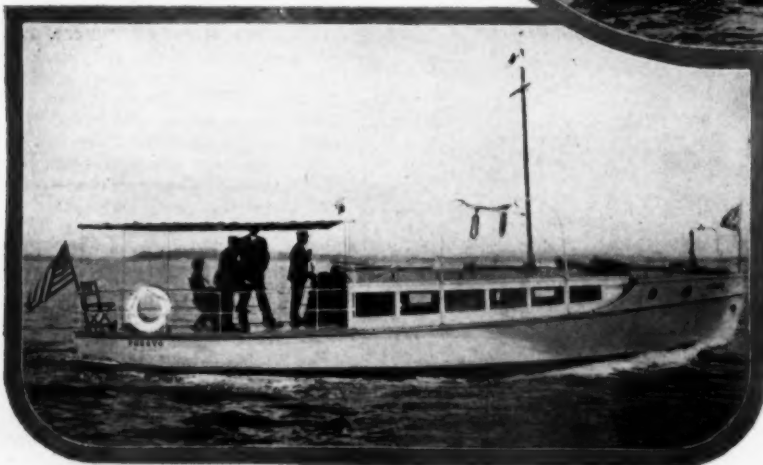
ing the freeboard forward and reducing the size of the windows.

Further troubles developed in this type of boat, due to the low vertical heights of the sides, causing lack of stiffness and strength in the hull. A compromise with a tendency to overcome these faults, particularly in small boats, was the so-called raised-deck cruiser, which was built with ample freeboard forward and a number of smaller windows in the cabin house.

The house was set back slightly from the side of the vessel, resulting in a



*A modern type of cruiser with comfortable cockpit space*



*Raised-deck cruiser with cool cabins combined with a flush deck aft*

deck space most of the way around the boat, a great convenience in boarding and disembarking. The windows were also protected from injury in better shape in this style of boat. After a year or two of this type with flush decks aft on which you could get a wetting from spray, some bright chap decided to introduce a cockpit in which the floor line was slightly above the waterline, and rain and water drained off through scuppers without help.

The hunting-cabin type is a further modification of the raised-deck type. The sheerline is unbroken and the cabin house sits on the flush deck. Instead of windows, ports are used for ventilation and light. A skylight helps to keep the temperature down some-

S P A N D A R D

what in summer, but on the whole the raised-deck type with reasonable windows is by far the more comfortable. When we get into the larger sizes of boats we meet the flush-deck cruiser, in which the cabins are all entirely under the deck and the vessel is large enough to accommodate them without appearing top heavy. On boats of this type all deck accommodations are high up and the style is not at all suited to small boats. Owing to the fancies of individuals, we are apt to meet numerous combinations of any or

Photographs by  
A. R. Brown

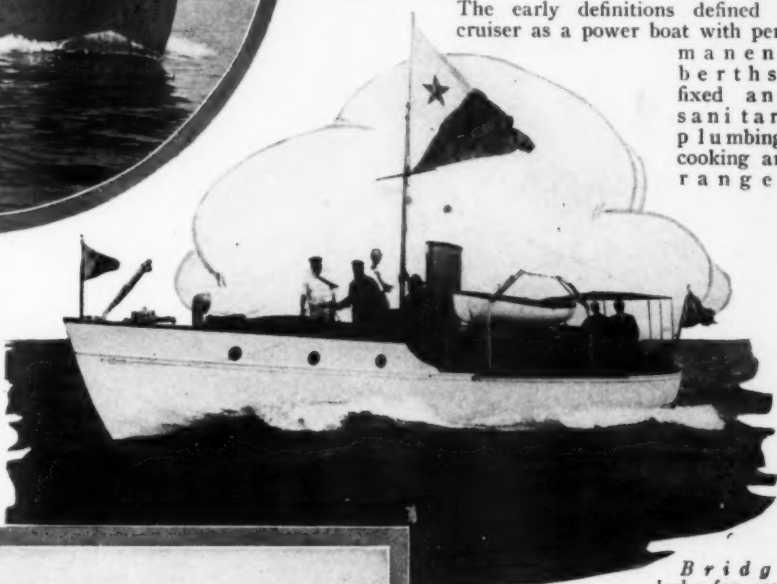


Forward bridge deck and large cockpit aft are possible on boats of this size



Large flush decks afford ample deck space on sea-going cruisers

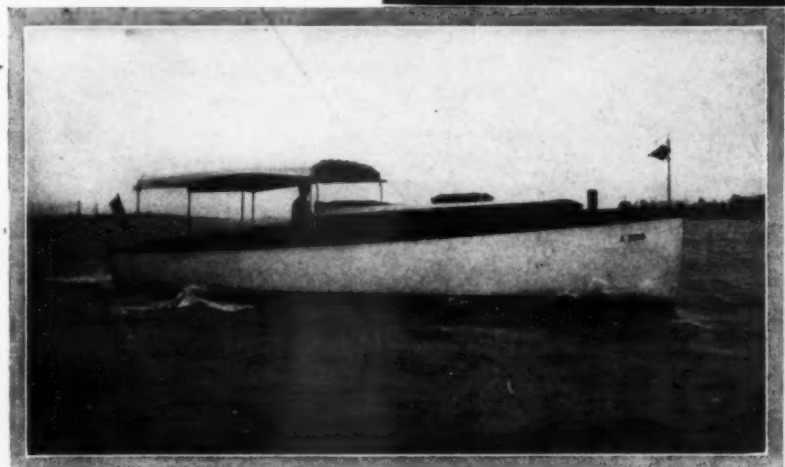
all of these different types. Some combine a raised deck with a little depression forward from which the boat can be navigated together with a comfortable cockpit aft. Others will fancy a large cabin with very little deck or cockpit space, still others will lean toward the opposite extreme and favor smaller cabins and more outdoor space. This variety of types found in all parts of the coun-



Bridge decks for control purposes are convenient

ments, and outfits necessary for living aboard. It must have a cabin entirely closed in and either flush deck or self-bailing cockpit. Heights of hatch coamings and headroom limits were also stipulated; open boats, racers, and hydroplanes composed the remaining classes and were all defined.

As the sport grew and more boats and greater varieties of them appeared at the competitions, it was soon seen that the scope of the rules would have (Continued on page 64)



At left, a more modern development in hunting cabin styles

# Elfay, Pioneer Diesel Electric Driven Yacht

The First Installation of Electric Drive, Using Winton Diesel Motors

**I**N installing a power plant to drive Elfay eight or nine miles an hour under power alone, the designers had a problem to contend with. An entirely new and novel arrangement was finally designed and used. This consists of a six-cylinder Model 54 Winton Diesel Oil Engine, rated at 115 h.p. direct connected to a 75 k.w. West-



inghouse generator which in turn was direct connected to a 9 k.w. exciter. The Westinghouse engineers cooperated with those of the Winton Motor Co. in solving the problems incidental to this installation.

The entire ship is operated and controlled by electricity; no steam whatsoever is used. Every last little accessory is operated by electricity. A big winch forward and others amidship are easily controlled by

*Elfay's prime source of power, the Winton Diesel oil engine, which drives the Westinghouse generator*

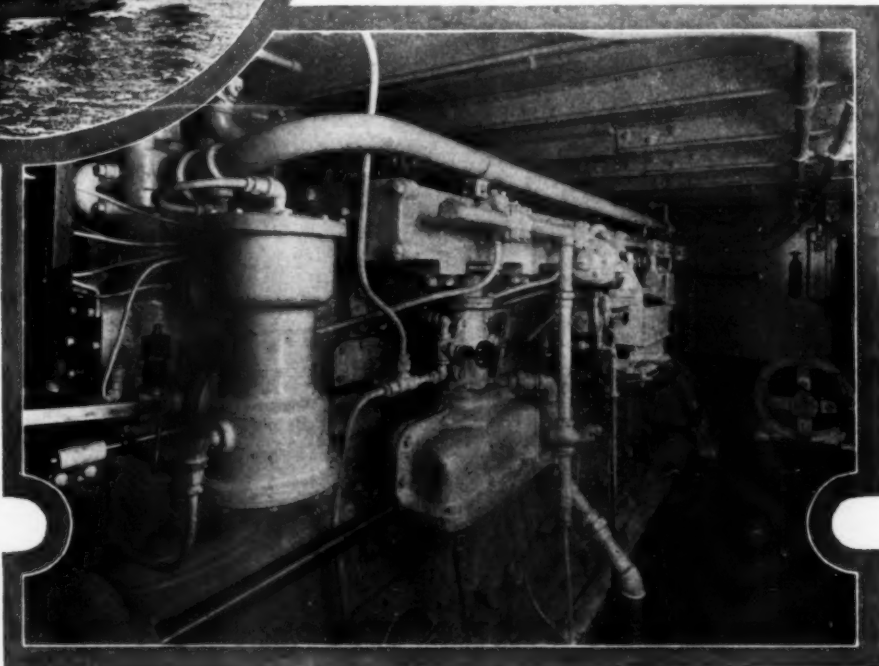


*Engine-room with the refrigerating machine in the foreground. The Quayle oil engine auxiliary generator set is on the right*

the use of this most flexible agent. The yacht is heated, lighted, ventilated and cooled, and controlled by electricity. In the engine-room there are to be found many electrical devices. A one-ton ice machine operated by a 7½ hp.p motor; a water pump; a bilge pump; an oil pump and an air pump which supplies oil fuel to the galley range.

An air compressor, Model W-18 Winton, is operated by a 12½ h. p. electric motor for compressing air for starting the main motors.

There is in addition to the main power plant an auxiliary set of 15 k.w. capacity. A 25 h.p. Quayle oil engine is used to drive this and charges the large







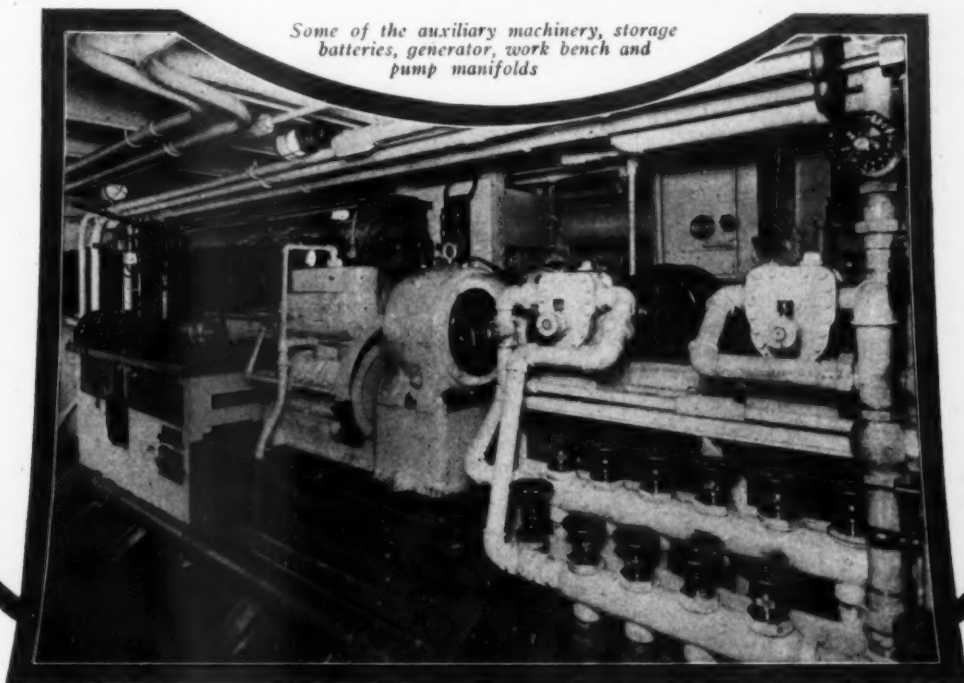
*Quarterdeck of  
Elfay; note the  
little control standard  
for handling the motor*

installation of storage batteries which furnish power when the ship is laying at dock or at anchor for any length of time. The batteries have a capacity of 300 ampere hours and can meet all requirements of the boat outside of actual propulsion, for two full days without recharging.

The control of the speed of the vessel is directly in the hands of the officer on deck. Moving the small controller handle enables him to stop or go to full speed astern on his main driving motor in the small space of five seconds.

This installation uses fuel oil, the cheapest fuel obtainable and supplies clean, quiet, and efficient power which can be always relied upon. The oil tanks have a capacity of 2,400 gallons or a radius of 2,000 miles on a consumption of  $7\frac{1}{2}$  gallons per hour.

In undertaking a voyage around the world in Elfay, R. A. Alger, her owner, places implicit faith in her power installation. It is interesting to note that efficient as this type of installation is in such a boat as Elfay, it is many times more efficient and desirable as an installation for cargo carriers.



*Some of the auxiliary machinery, storage  
batteries, generator, work bench and  
pump manifolds*

The fourth of the series of charts giving compass courses for various popular cruising grounds. These are not intended to be short cuts but reliable courses which can be checked at each buoy. This small chart shows only a few of the important lights and buoys. C. & G. S. Chart No. 369, should be consulted in connection with this one in order that all features not shown may be fully understood. All courses given here are magnetic and it will be necessary to know what your compass deviation is and make the proper correction.

**NEW YORK CITY**  
**JERSEY CITY**  
**BROOKLYN**  
**STATEN ISLAND**  
**NEWARK**  
**ELIZABETH**  
**UPPER BAY**  
**LOWER BAY**  
**RARITAN BAY**  
**SANDY HOOK BAY**  
**HUDSON RIVER**  
**PASSAIC RIVER**  
**KILL VAN KULL**  
**NEWARK BAY**  
**BAYONNE**  
**GRAVESEND BAY**  
**CONEY ISLAND**  
**ROMER SHOAL**  
**AMBROSE CHANNEL**  
**MAIN CHANNEL**  
**SOUTH CHANNEL**  
**GEDNEY CHANNEL**  
**ATLANTIC HIGHLANDS**

**LEGEND:**  
 ☆ LIGHT  
 ◊ RED BUOY  
 ▽ BLACK BUOY

**DISTANCES IN STATUTE MILES**  
 1 0 1 2 3  
 SCALE-STATUTE MILES

# Widely Varying Types of Motor Work Boats

Photographs by Fred C. Milliken



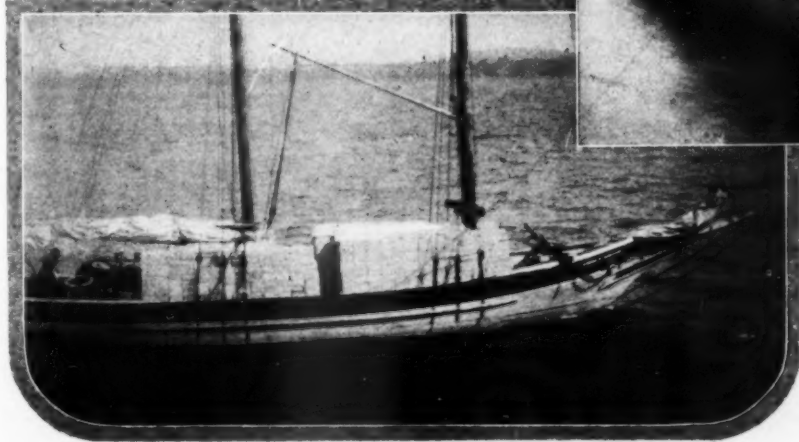
Below  
Here is Pharo  
(sea goose), the  
unarmed Canadian patrol boat that looks after the  
Canadian fishing interests. She was built a few  
years ago at Richardson, Deer Island, New Brun-  
swick, and is equipped with a 55 h.p. American  
Standard motor, making 11 knots. She is 58 feet  
long, 12½ feet beam, and draws 5½ feet. She  
carries a crew of five



The war called back this craft, Dog Fish, and she has been making the most of her opportunities. She is a type of self-propelled motor boat that can carry immense quantities of cargo. She is an 87-footer, with a beam of 23-5, flat bottom, wide stern, roughly but strongly constructed, and is equipped with two 24 h.p. Knox motors, with a speed of 5 knots. The engines are also used as cargo derricks. She has been used to carry logs and pulp wood



This schooner, Louise B. Robinson, was built at Barnegat, N. J., in 1884, long before the introduction of motors into small schooners, but her owners have found gasoline engines of great value in making quick trips regardless of calm or fog. She is of 30 tons, 54 feet long, 18 feet 8 inches beam, with a draft of 5 feet 8 inches, and has had two Lathrop gasoline engines of 10 and 16 h.p. installed and the sails are rarely used

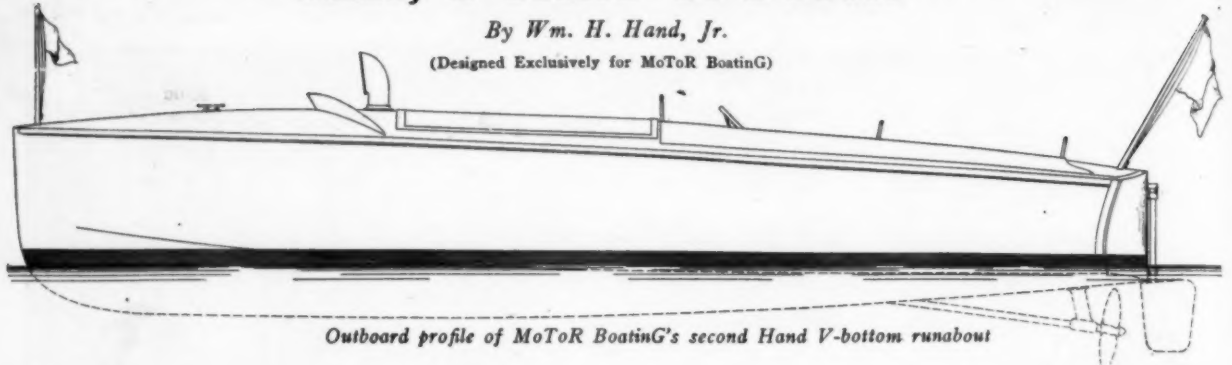




# Jane, a Hand 18-Footer

By Wm. H. Hand, Jr.

(Designed Exclusively for MoToR BoatinG)



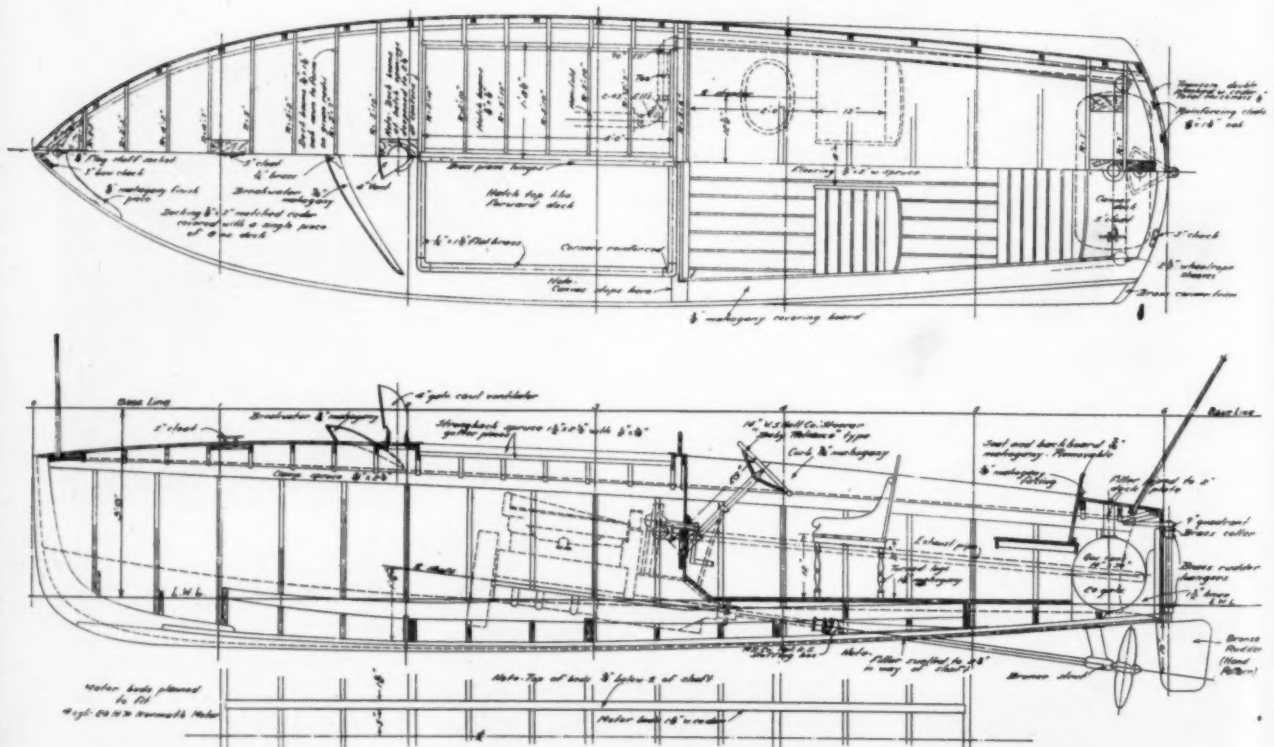
Outboard profile of MoToR BoatinG's second Hand V-bottom runabout

**W**HAT did you think of the 15-foot runabout Edith last month? Pretty good for a small boat, eh? Here is a little bigger boat that goes it one better. Our plans this month are for a fast little runabout of 18 feet in length. When equipped with the specified 20 h. p. Kermath motor this outfit should be able to do 17 to 18 m.p.h. without any difficulty at all. The design of this little boat is in a general way similar to the one published last month. When it comes to power plant, however, we see that the design is entirely different. The engine is more nearly amidship and the cockpit aft is entirely clear. This location of the power plant shifts the weights further forward and compensates for the weight of passengers in the cockpit. When under

**H**ERE is the second of the series of twelve complete sets of working plans for V-bottom, easy-to-build motor boats, which William H. Hand, Jr., is to design for MoToR BoatinG readers in 1920. One set complete with specifications and all information necessary to build the boats will be published in each issue of this magazine during 1920. Favorable comments have already been received from numerous readers in all parts of the country about this series. Many have announced their intention of starting work on one of these boats as soon as the plans are published.

The design this month is of an exceptional, thoroughly able little boat, outclassed by none. Our plans for next month will be of a bigger boat still, a 21-foot runabout.—Editor.

way the tendency to lift out forward or plane is counteracted to the proper degree by the selected motor. That explains to some measure why the naval architect is so particular in the selection of the power plant. Having designed a boat and figured on its speed and angle of planing and a lot of other things, he does not like to see his calculations entirely upset by some smart novice who decides to put in a bigger engine and get more speed. The inevitable result of this is to bring the boat down by the head, interfere with the lifting out forward at speed, and the creation of a tremendous fuss and get more speed. The inevitable result of this is to bring the boat down by the head, interfere with the lifting out forward at speed, and the creation of a tremendous fuss from this is that the naval architect has very good and



Inboard profile, construction, and deck plans with details of materials and engine installation. Scale  $\frac{3}{8}$ -inch equals 1 foot

sufficient reasons for everything that he does in the design of a boat. The weights are calculated, and the engine is located at a particular point. The seats are located with a reason, and any attempts to improve on the design on the part of the novice are certain to result in failure as far as satisfactory performance of the boat is concerned.

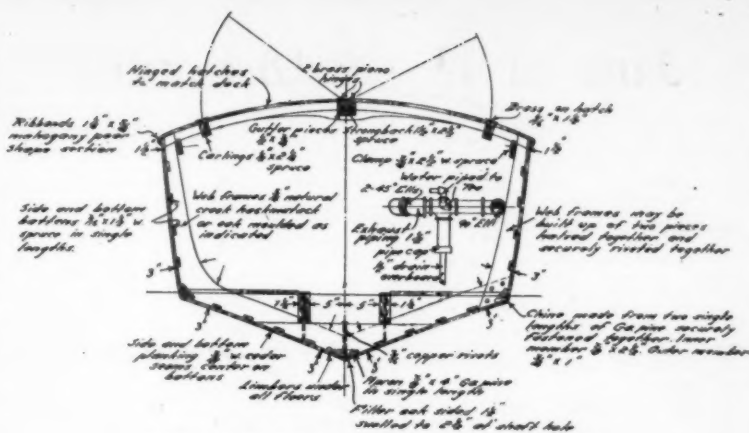
Mr. Hand has had ample experience and skill in turning out fleets of small boats, and his designs should be followed without changes.

This boat is a little heavier in construction than the 15-footer published last month. Her greater speed and power make a little increase in frames, planking, etc., necessary. The outside lines are similar to other of the famous Hand V-bottom designs and the construction as before follows accepted-Hand practice. A boat built to these plans can still be completed in ample time for use next summer. It is not such a very difficult task if started promptly and prosecuted diligently. In order to be sure of being able to prosecute the construction without delays due to the weather it would be advisable to begin the work indoors

in a suitable shed or building.

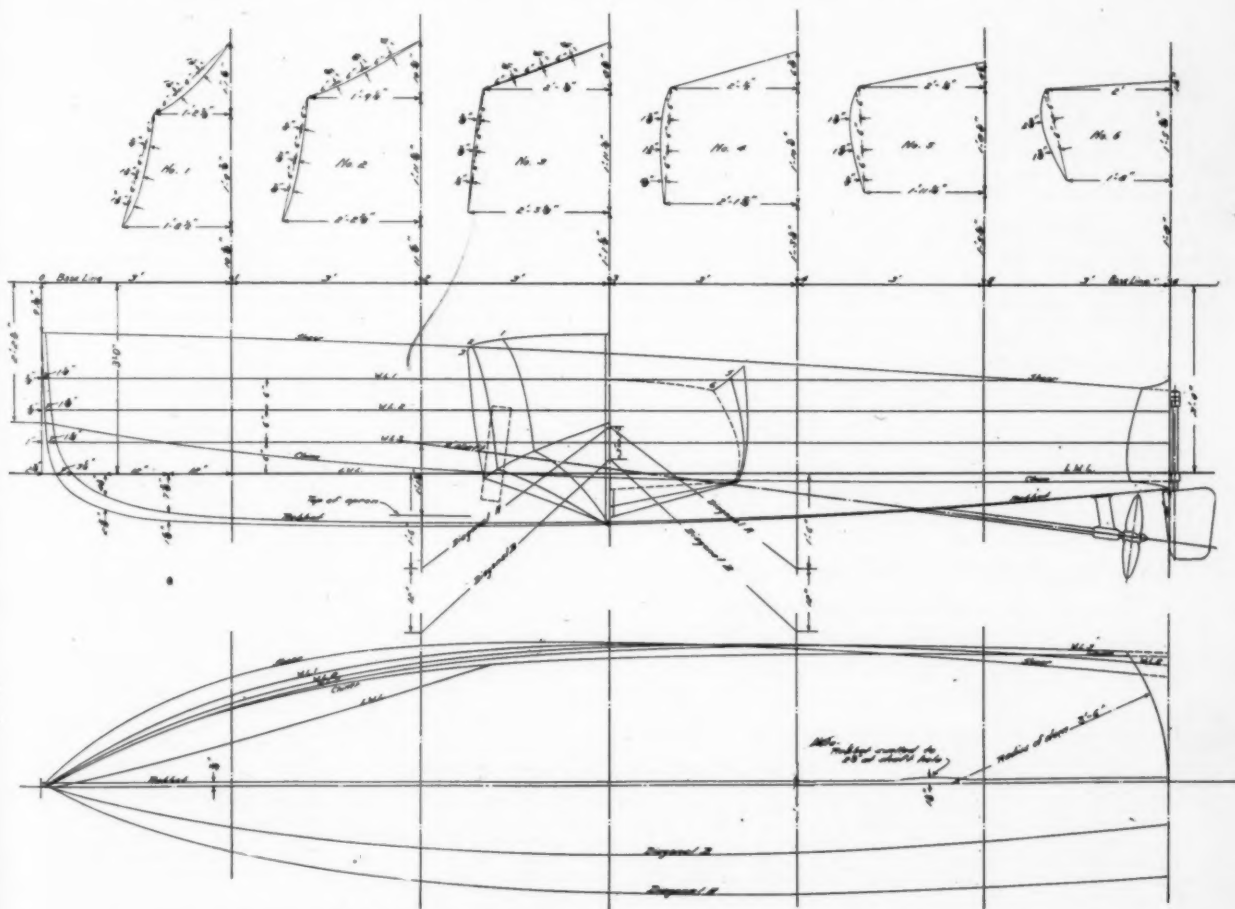
The simplest method of going about the building is of course assembling the frames in an inverted position and carrying the entire job of the hull proper through to completion in this manner.

Beginning with the frames, these are all cut and prepared in advance. Patterns are drawn to full size on heavy paper in accordance with



Section at Station 3, midship, gives all material sizes and necessary details. Scale  $\frac{1}{2}$  inch equals 1 foot

the dimensions of the sections given on this page. Note particularly that the dimensions given on sections are to the outsides of planking for which allowance has been made. Web frames at station points are to be three-quarter-inch sided of oak or apple tree and molded as indicated on the midship section at station 3. Between each set of web frames there will be two bent frames, as indicated on next page, of five-eighths by three-quarter-inch oak. The web frames will be notched out for the chime piece and seam battens while the intermediate bent frames are securely fastened inside of all battens. The web frames after completion are assembled in an inverted position and fastened to a stay so that the distances from



Complete set of lines in profile, section and plan for 18-foot Hand V-bottom runabout. Scale  $\frac{3}{8}$  inch equals 1 foot

the base line will be correct as called for in the sections. Most suitable for the base line support is a heavy plank on edge and properly blocked to prevent overturning. On the upper edge of this base line are marked the frame spots and the mid-ship section frame is erected first in its inverted position. Care must be taken to plumb the frame perfectly in all directions. The rest of the frames should then be erected in turn and in their proper order. Carefully fasten and stay them all in position so that they will be immovable. The keel, stem, and stern are prepared and assembled next. The apron is a single length of Georgia pine  $\frac{7}{8} \times 4$  inches. The stem is of  $1\frac{1}{2}$ -inch oak or hackmatack and is rabbetted for planking. White spruce is used for the seam battens which are applied in one length and so fitted as to form a backing for the seams in the planking. The web frames are notched to receive these battens and also the corner chine piece. Note carefully whether the transom is perfectly plumb. Our drawings do not call for any rake on this one at all. All lines of battens should be absolutely fair; swellings and depressions should be carefully watched for and corrected. The next operation is the planking. All lines of seam battens being smooth and fair, the lines of plank seams will similarly be fair. Fasten the frames and planking together as called for in the specifications. The first plank installed should be the garboard strake adjacent to the keel, working then out to the chine and up to the top strake. After the planking is entirely on and fastened the hull can be turned right side up. This can be accomplished by calling for help at the motor boat club some evening and inviting a little co-operation from one's idle friends. Deck beams can be sawn to the radii given and the crown of the deck should be smooth and continuous. At a later time the entire forward deck should be covered with a single piece of 8-oz. canvas. Engine foundations and other details all follow along in order and seats, trim, and accessories gradually lend grace to the hull. The engine is among the last items to be installed and after the struts and propeller castings are all made and attached, our boat is almost completed. There remains only the painting, varnishing, and trimming when she will be ready for a tryout. The equipment required by law will be the same as for "Edith." Lights—a combination red and green lantern and stern lights; a capable whistle; a life preserver or buoyant cushion for each passenger on board; and a fire extinguisher capable of extinguishing burning gasoline. A registration number must be obtained and two copies of the pilot rules carried. A complete set of specifications which in conjunction with the plans are sufficient data for anyone to construct this boat follow:

## Specifications for 18-Foot V-Bottom Runabout Jane

Prepared Especially for MoToR BoatinG

By Wm. H. Hand, Jr., N. A.

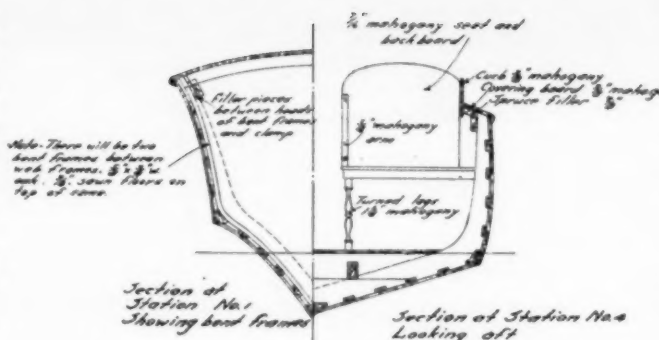
New Bedford, Mass.

Dimensions: Length over all 18 feet, beam 4 feet  $6\frac{1}{4}$  inches, draft of hull, 10 inches.

Materials: To be strictly first class in every respect, all fastenings to be secure and complete.

Filler: To be of white oak, sided  $1\frac{1}{2}$  inches, swelled to  $2\frac{1}{4}$  inches at shaft hole, and molded about 2 inches at stem scarph, tapering to about  $\frac{1}{2}$  inch at aft end.

Apron: Of clear tough Georgia pine in single length,  $\frac{7}{8} \times 4$  inches, bent to form and securely fastened through cross ties at heels of frames. To be fastened to filler with  $1\frac{1}{2}$  inch No. 10 brass screws spaced about 6 inches on centers. Stem, apron, and filler to be fastened together with



Construction sections forward and aft give many details. Scale  $\frac{1}{2}$  inch equals 1 foot

$\frac{1}{4}$  inch galvanized bolts.

Stem: To be as indicated of oak or hackmatack, sided  $1\frac{1}{2}$  inch and molded as indicated. To be rabbetted for planking and bearded to carry out all lines of same. To be fitted with a  $\frac{3}{8}$ -inch brass band extending from head to about 18 inches below and aft of L. W. L.

Stern: To be double planked of white cedar, total thickness  $\frac{1}{2}$ -inch reinforced by center knee as indicated with reinforcing oak cleats for side and bottom stringers, with intermediate side cleats of oak spaced two in each half of stern as shown.

Frames: On each station marked there will be web frames formed of  $\frac{3}{4}$ -inch oak or apple tree as indicated, notched for stringers and chines. Heels of frames to be securely riveted to  $1\frac{1}{2}$ -inch cross ties under engine beds as indicated. Cross ties to be bolted through apron and filler with one  $\frac{3}{8}$ -inch galvanized bolt through center of each. All parts of frames to be very carefully fitted and very securely fastened. Between each pair of web frames there will be two bent frames as indicated  $\frac{3}{8} \times \frac{3}{4}$ -inch white oak.

Stringers: Bottom and side stringers are to be of clear white spruce,  $7/16 \times 1\frac{1}{2}$  inches, extending full length of hull in single lengths, spaced as indicated with ends fastened to stem and stern securely. All stringers to be spaced exactly as shown, dividing the space between shoe and chines and sheer and chines into equal parts in width, as they form ribband backing for planking seams. To be fastened to each frame crossed with two  $1\frac{1}{2}$  inch No. 10 brass screws.

Clamps: Of selected spruce,  $\frac{3}{4} \times 2\frac{1}{2}$  inch, set as indicated to support decking alongside of cockpit and securely fastened to heads of frames. To be reinforced in way of cockpit by indicated  $\frac{3}{8}$ -inch spruce filler pieces to form backing for cockpit curb fastenings. Clamp to extend full length of hull.

Chines: To be of clear Georgia pine as shown, in two pieces, inner member or apron and filler securely fastened together with copper rivets spaced about 6 inches. To be fastened to web frames and bent frames with  $\frac{1}{8}$ -inch copper rivets.

Deck Beams: To be of oak sawn to form on given crown radii, sided  $\frac{1}{2}$ -inch and molded  $1\frac{1}{2}$ -inch, spaced as indicated with ends halved into clamps and securely fastened to same.

Motor Beds: The indicated bed plan fits a 20 h. p. Kermath motor, and is to be adapted to fit the motor installed in the matter of motor arm or base flange heights. Bed pieces to be of  $1\frac{1}{2}$  inch spruce, bolted through cross ties as indicated. All parts of bed to be very securely fastened, after being carefully fitted to bear evenly on top of cross ties.

Frame in general: All exposed edges of clamps, stringers, frames, chines, deck beams, etc., to be neatly finished with chamfered edges.

Planking: Bottom and side planking to be of selected white cedar to finish  $\frac{3}{8}$  inches thick with seams centered on indicated stringers, all planking strakes running fore and aft in the usual manner. To be five strakes on each side above bilge line and like number below. All butts to be made on blocks of same width as space between stringers and 12 inches long of same material as planking, with ends of adjoining parts fastened securely to same by  $\frac{3}{8}$ -inch No. 6 brass screws. Planking to be fastened to apron, chines and stringers with  $\frac{3}{4}$ -inch No. 6 brass screws spaced 3-inch on centers and staggered to prevent splitting of parts. Planking also to be fastened to frames between stringers with two  $\frac{3}{4}$ -inch No. 6 brass screws into each frame crossed. Bilge edges to be neatly rounded, all seams to be lightly caulked with cotton, run with paint and payed with white lead putty. Apron, chines, and stringers are to be thickly coated with thick paint, previous to setting planking in place, with planking fastened down while paint is soft. All screwheads to be neatly countersunk and covered with beeswax applied as putty when warm.

Decking: To be of  $\frac{3}{4} \times 3$ -inch cedar or white pine, no beading, layed fore and aft in the usual manner and fastened into deck beams, clamp and top strake with  $1\frac{1}{4}$  inch galvanized wire nails, with heads let in and puttied. Deck to be planed perfectly smooth, heads of nails covered with putty and entire deck to be covered with single piece of heavy unbleached cotton sheeting laid in shellac or marine glue and ironed down into place with hot flat irons. Edges to be hauled down over outer edge of deck and neatly covered by ribband rail when in position.

Cockpit curb: To be of  $\frac{3}{8}$ -inch mahogany, fitted as indicated, (Continued on page 198)



# Starting Correctly to Build

IX—Showing Two Different Ways for Constructing the Sides of a Cabin House with, in Addition, a Simple Type of Companion Slide, Companion Doors, and a Practical Design for a Flush Hatch

By William Atkin

SINCE the hull is practically complete it may be of advantage to turn our efforts to some details of the exterior joiner work. True, there is still miscellaneous work to be completed on the exterior of the hull, such as stringing the moldings, hanging the rudder, applying the stem band, fitting the rudder shoe, and completing the painting. These for the time being may well be set aside until the cabin grows to completion, and the cockpit is practically finished. Neither must we forget the installation of the motor with its various equipments; nor the proper supplying of a good steering gear.

Figure 67 shows a rabbeted corner post for the cabin house. This would be the construction of a house similar to that shown in Figure 68 and is not only simple in construction but a good, substantial bit of work.

The four corner posts are first erected. These being rabbeted to take the siding, which will be  $\frac{7}{8}$  inches thick, are so cut that the portion outside of the rabbet rests upon the deck while that portion inside of the rabbet drops below and

This article is the eighth of a series by Mr. Atkin which will take up the complete building of a boat, step by step, in the proper order in which the construction work should be done.

A brief resumé of previous articles is given for ready reference:

I—June 1919—The Laying Down of Lines—and the Proper Interpretation of the Plans.

II—July 1919—Shaping the Stem, Keel, and Deadwood.

III—August 1919—Constructing the Deadwood and Boring the Shaftlog.

IV—September 1919—Various Methods of Stern Construction, Setting Up the Keel, and Bending of Frames.

V—October 1919—Steaming Woods, Fitting the Floors, Frame Fastenings, and Cutting the Timbers.

VI—November 1919—Methods of Planking and Caulking the Hull.

VII—December 1919—Beveling the Frames and Fitting the Deck Beams.

VIII—January 1920—Various Kinds of Engine Beds Which Are Suitable for Small Craft with some Notes on Some of the Better Ways to Construct Them

Useful methods and practice followed by boat builders which will prove valuable to the amateur as well.—Editor.

is fastened to the deck beam and cabin side carlin.

The siding for this type deck house is of a single piece of  $\frac{7}{8}$ -inch lumber. This, of course, must fit closely to the deck and neatly into the rabbet of each post.

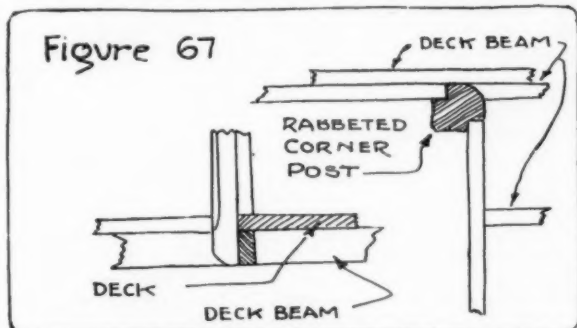
If the deck house is high two pieces of plank may be required to cover the side. In this case match the joining of the two planks and cement them together with No. 10 Jeffery's Marine Glue, as shown in Figure 69.

If the house is wide or long it will prove best to run cleats across at 3-foot intervals, as also shown in Figure 69.

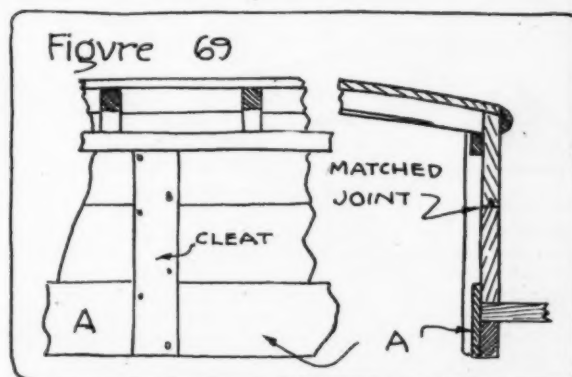
The house siding is held to the deck by the  $\frac{7}{8}$ -inch thick strip marked "A" in Figure 69. This is screwed alternately to the house side, to the edge of the deck, and to the fore-and-aft member that secures the inner ends of the short side deck beams. Screws make the best

fastenings for this, as their heads can be countersunk.

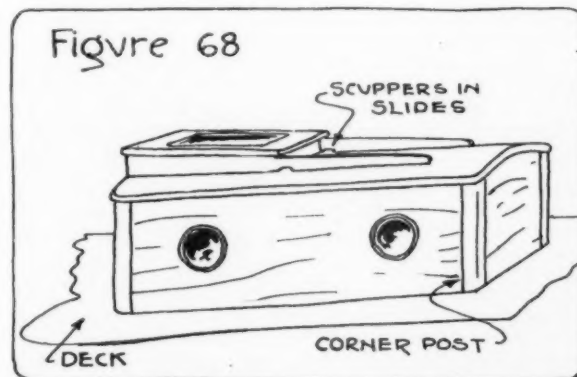
The holes for port lights are best cut with an extension bit provided they are not greater in diameter than 5 inches;



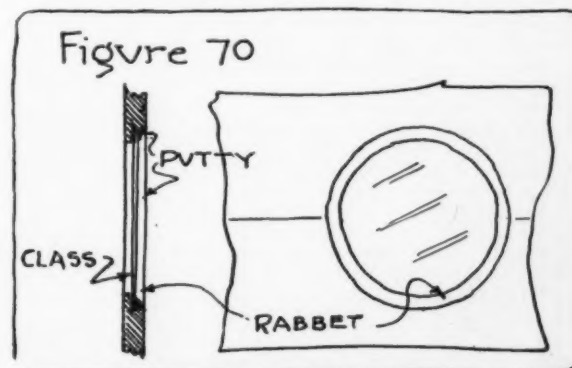
Rabbeted corner post for cabin house



Matched joint in siding of deck house

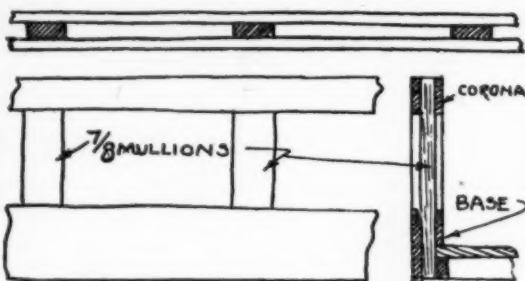


Deckhouse showing corner posts



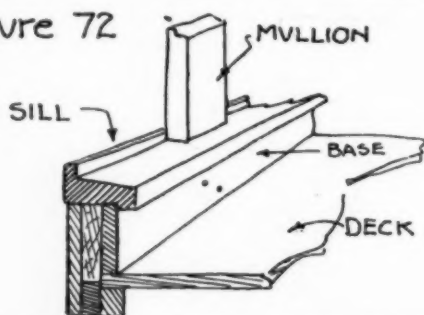
An inexpensive port light for small houses

Figure 71



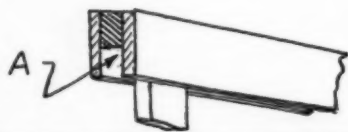
Cabin side to accommodate square windows

Figure 72



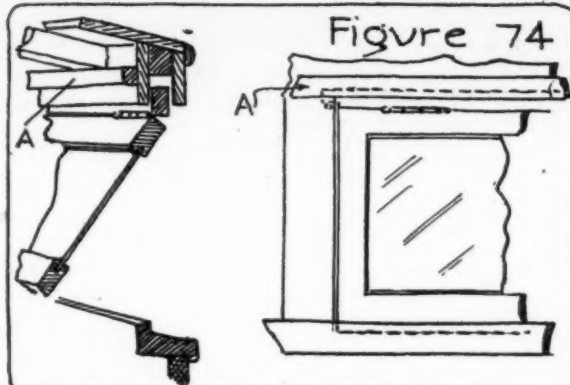
Shaped sill is cut out for the mullion

Figure 73



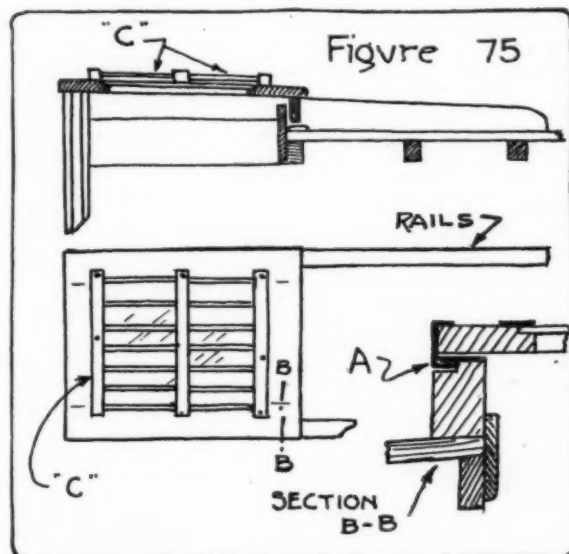
Construction of cabin side at top

Figure 74



Showing method of raising windows and swinging them inboard

Figure 75



Construction details of a companion slide which is thoroughly satisfactory although a little unusual

which after all is large enough for a small boat. If regulation swing ports are used the hole is cut straight through to one diameter and the port is set into this. Some port lights have to have cut-outs for the hinge and catches.

A very inexpensive port, although one with a fixed glass, may be made by letting a circular piece of glass into the cabin side as shown in Figure 70.

The hole for this may be cut with an extension bit; cutting first to a depth of  $\frac{1}{2}$  inch for the diameter of the glass; then cutting through at a reduced diameter, so forming a rabbet against which the glass may back. Fasten the glass with glazier's points and complete the job with putty.

Suppose square windows which are to open in are desired in the cabin sides. Then a single plank side is not the best of construction. In Figure 71 is shown a cabin side built especially for the accommodation of open windows.

Corner posts similar to those shown in Figure 67 are used but here the similarity ceases. In order that there may be room for the window sash to lift over a rabbet on the sill, and then swing, the side must be in two parts—outside and inside—with of course mullions between the window sashes. If the sash is  $\frac{3}{8}$ -inch thick the mullions will be  $\frac{3}{8}$ -inch thick also. These extend below the deck as shown in Figure 71 and are spaced at proper intervals to accommodate the size of sash used.

Outside at the deck a baseboard  $\frac{1}{2}$ -inch thick and perhaps 3 inches wide is fitted to the deck and extends fore and aft to the rabbeted corner posts, and is fastened there. Inside

of this  $\frac{3}{8}$  inch filling pieces are fitted between the mullions. And these and the bottom of the mullions are then covered with a  $\frac{1}{2}$  inch thick finishing piece which extends continuously from post to post. A shaped sill is set upon this with cut-outs for the mullions as shown in Figure 72.

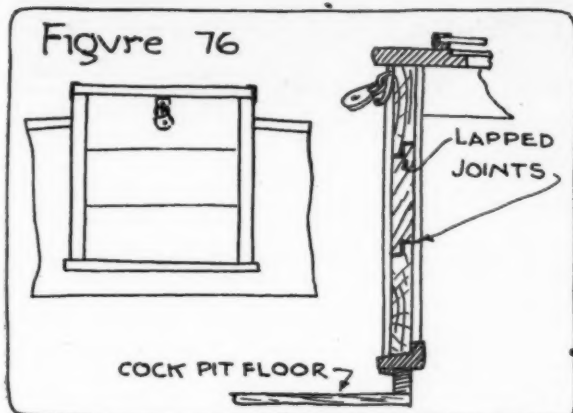
At the top the construction of the cabin side should be like that in Figure 73. The recess "A" must be deep enough to allow the lip which is hinged at the top of each sash to lift with the sash a distance a little greater than the height of the stop on the window sill. It is only by having the sash slide up that this type of window can be made water-tight. It raises first, and then swings inboard. See Figures 74.

If windows are cut in the forward or the after ends of the house the construction should be similar.

The cabin top carlins are fastened to a strip which is screwed along the top of the cabin side as shown at "A" in Figure 74. The roof is planked with narrow width tongue and groove ceiling and then covered with canvas.

The companion slide can be made in several ways, but even the best have faults which the water has a way of getting by.

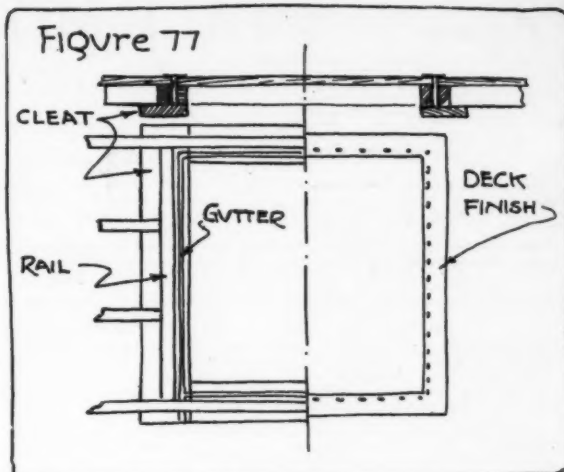
In Figure 75 is shown a very easy way to make a sliding hatchway and one that having a light of glass in its top provides light to the cabin. I know this sort of a slide is not the usual nautical kind which has been handed down from past generations, but I also know it provides a fine hatch cover. The sketch shows that the cover is built very much like a window sash, and without crown. It should be at



Simple method of enclosing the cabin with use of doors

least  $1\frac{1}{8}$  inches thick and the glass ought to be let in just flush with the top surface. Set it in marine glue and cover the edges with a strip of  $1/16$ -inch brass about 1 inch wide; the latter screwed to the hatch, of course. To protect the glass, fit a grating made of  $1/4$ -inch brass pipe with three cross cleats of wood bored so as to hold the rods at a distance of about 2 inches from each other. See "C" in Figure 75. Only the center one is pierced through; the end ones should be bored but half way through. This to hold the lengths of pipe secure.

The hatch rails should be cut to a taper fore and aft of about  $3/8$  inch to the foot, and be twice as long as the hatch cover. A small rabbet  $1/4$ -inch deep by  $3/8$ -inch wide must be cut along the outside top edge of each. By shoeing the top with a strip of  $1/16$ -inch flat brass a groove is formed in which one of the sides of a piece of channel shaped brass, which is screwed to the edge of the hatch cover, fits; see "A" in Figure 75. The brass shaped channel must be in a single length and screwed along both sides of the hatch.



Hatchway for the cockpit floor over the motor

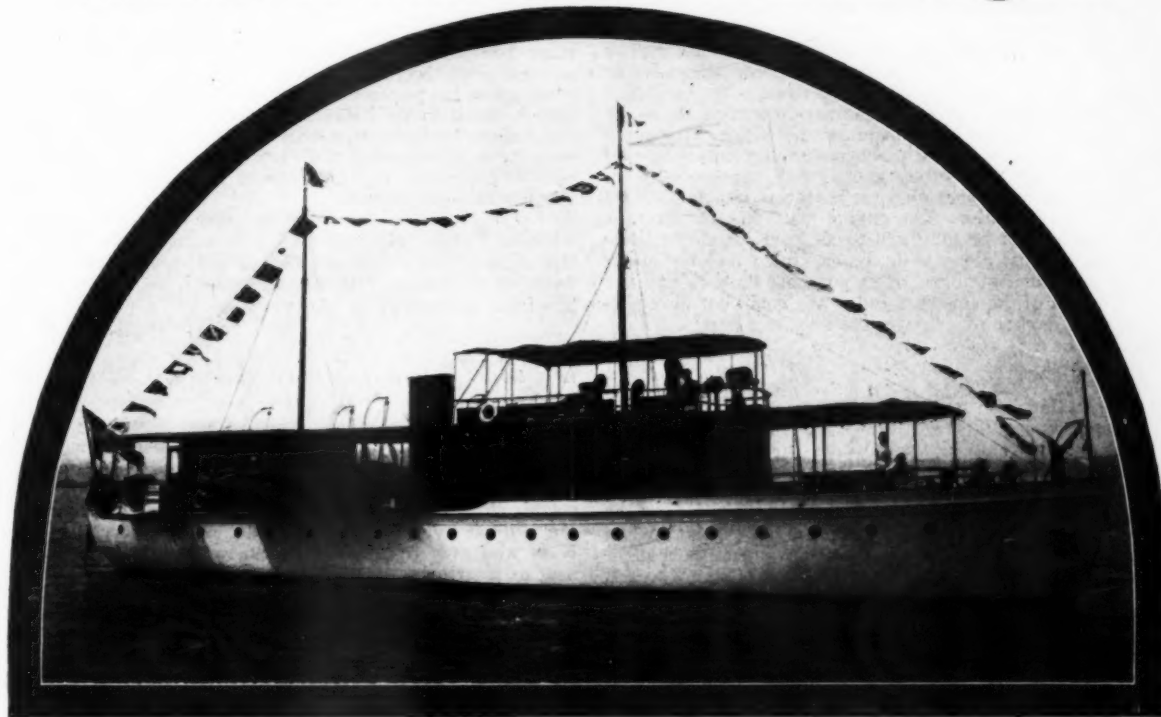
The rails are screwed from the under side of the deck, and with round-headed screws, for it may be desirable at some future time to get them off. Around the hatchway there should be wood to form a neat finish.

Rather than companionway doors three boards so rabbeted that they will remain tight create a good enclosure for the cabin. Figure 76 shows the simplicity of this. The jamb, if it can be so called, has stops both inside and outside, and these form a track in which the door boards slide. A sill is also necessary and it should be made as shown with a stop molded on it to prevent water from flowing past the sill.

A hatchway in the cockpit floor over the motor may be desirable in view of which the suggestions laid out in the sketches in Figure 77 are given. An opening is cut in the cockpit floor beams and at each side a rail is extended fore

(Continued on page 80)

## Vidofner II Gets a Pair of Winton Engines



This 110 x 20-foot cruiser designed by Cox & Stevens, has just been repowered with a pair of modern six-cylinder 8 x 11-inch Winton engines which are entirely enclosed and oil-proof. Vidofner II is now in Florida



# SMALL MOTOR BOATS

## Their Care, Construction, and Equipment

A Monthly Prize Contest Conducted by Motor Boatmen

Questions Submitted for April Prize Contest

1. Describe a practical method of locating unsound planks, especially those caused by dry rot and not readily apparent from the outside of the hull; also, what would you do to prevent a recurrence of dry rots?  
*Suggested by J. W. K., Jersey City, N. J.*

2. Tell how to make a half model from the drawing of the lines of a boat. Best material to use, number and kind of tools, finishing, etc.  
*Suggested by L. K., New York City*

3. Give the main features of design of your ideal marine engine which differs from current practice, with reasons therefor.  
*Suggested by H. H. P., Oakland, Cal.*

4. What is the best type of mooring buoy; how is it constructed and by what method can you estimate the weight of different lengths of chain it will sustain?  
*Suggested by F. A. K., New York City*

### Rules for the Prize Contest

ANSWERS to the above questions for the April issue addressed to the Editor of *MOTOR BOATING*, 119 West 40th St., New York, must be (a) in our hands on or before **March 6**, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses.

The name will be withheld and initials used.  
QUESTIONS for the next contest must reach us on or before **March 6**. The Editor reserves the right to make such changes and corrections in the accepted answers as he may deem necessary.

The prizes are: For each of the best answers to the questions below, any article or articles sold by an advertiser advertising in the current issue of *MOTOR BOATING* of which the advertised price does not exceed \$25, or a credit of \$25 on any article which sells

for more than that amount. There are three prizes—one for each question—but a contestant need send in an answer to only one if he does not care to answer all.

For answers which we print that do not win a prize we pay space rates.

For each of the questions selected for use in the following month's contest, any article or articles sold by an advertiser advertising in this issue of *MOTOR BOATING*, of which the advertised price does not exceed \$5, or a credit of \$5 on any article which sells for more than that amount.

All details connected with the ordering of the prizes selected by the winners must be handled by us. The winners should be particular to specify from which advertisers they desire to have their prizes ordered.

## Instalment Sales Would Benefit the Sport

General Sentiment Agrees That the Sale of Motors on Deferred Payments Will Boost Motor Boating

Answers to the Following Prize Questions in the December Issue

*State whether you think it would be advantageous to the sport and result in an increased motor boat ownership if a marine engine manufacturer sold his product on the instalment plan, as in other lines of business*

### A Feasible Plan for Instalment Sales

(The Prize-Winning Answer)

UNDER the ordinary operation of the instalment plan I believe that the sale of marine motors in this manner would not be helpful to the sport. The man who cannot afford to purchase a motor outright must expect to pay more for it in instalments, and he must add his monthly payments to the current expenses of running his boat. He may saddle himself with an obligation which he cannot meet, and if he is unable to make the payments he will find himself in the position of a man who owns a boat and powers it with a borrowed motor which at a most inconvenient time he is required to return. If at length he does complete payment he finds himself owner of a motor whose value has been depreciated by some months' wear.

Taking the other side of the transaction we find the motor manufacturer in a no less embarrassing position. He cannot have the assurance of the piano maker, for instance, that his product will be carefully housed and may be easily attached if the instalment-plan purchaser is unable to meet his monthly obligation. The engine manufacturer's risk is much greater, for he must sell to all kinds of motor boatmen, the careless along with the careful, while his motor during the extended period of its purchase must be exposed to the action of the elements and to the small but nevertheless present danger of damage and loss by fire or collision. Although he may add a figure or two to the purchase price of his motor, the hazard is so much greater than with other kinds of merchandise that it will hardly pay him to conduct business in this way.

It occurs to me, however, that a unique arrangement for instalment sale could be made which would meet the purchaser's means and conform to the rather peculiar conditions of the motor-boat trade. This plan would work somewhat as follows: The engine manufacturer, facing the worst season of his year—October and November, when boats are being hauled out and few owners have thought ahead to the requirements of the next year—offers to sell his product at list prices or even slightly less to those desiring to pay on instalment through the winter months. The builder retains possession of the motor until the March or next-to-the-last payment has been made; final payment to be accomplished upon receipt of the motor by the owner at fitting-out time.

The advantages of this scheme would be somewhat as fol-

lows: The manufacturer would be assured late in the fall of a certain amount of business to carry him through to the spring rush; he would have a fixed income from the instalments upon which to base plans for expansion of his business; and he would be assured that his product could not be depreciated by wear before he had received full value for it—an advantage which would not be his under the usual method of instalment sales.

The owner would pay for his motor during the period of the year when there are no current boating expenses; he could count on prompt delivery; and he would come into possession of it in the spring as full owner with no liabilities to worry him later. He would find that the manufacturer, being desirous of securing early business, and taking account of the accruing interest on the monthly instalments, could quote list prices or less. Finally, in the event that the owner found himself unable to complete payment of the instalments he could terminate the agreement at any time with the reimbursement of all his money except a small forfeit—a procedure which he could not expect under any usual instalment scheme.

It is my opinion that only by some such arrangement wherein neither manufacturer nor purchaser assumes a risk of loss could instalment-plan purchase of marine motors result in permanently increased motor boat ownership or be of any advantage to the sport.

A. F. L., Huntington, N. Y.

### Would Cause a Decided Boom in Motor Boating

SELLING marine motors on the instalment plan would no doubt increase the motor boat ownership to a considerable extent. Such a scheme has many points to commend it. In the first place, just at the present time there are a great many young fellows who have served in the Navy and as a result of their experience want to have a boat of their own. They have been taught efficiency in the service and they look for an outfit that is dependable and economical. But with most of these ex-gobs the "jack" counts a lot and it is not possible to lay down spot cash for the engine they want. As a consequence they either do not purchase or else take a long chance on some second-hand motor at a price conforming to their pocketbook. The majority of such motors have outlived their usefulness and are

fit only for the junk pile. The engine may function in some sort of fashion at times, but it so often fails at the wrong moment that both the owner and his friends become disgusted, thus the actual and potential motor-boat owners are lost to the fraternity altogether. Many times old automobile motors are pressed into marine service simply because of the lower first cost—the result is usually disastrous.

The writer is strongly of the opinion that such cases as the above are invariably the cause of so much joking at the expense of the motor boat, which proves detrimental to the sport generally. Anyone at all familiar with the marine engine of today knows that with an up-to-date motor, whether it be two or four cycle, of any well-known make, the operator by exercising minimum care will find his machine both reliable and efficient.

Time payments could be arranged by the manufacturer along the same lines as in mostly any other instalment business. A slight additional charge would necessarily have to be made, of course, but most purchasers would agree to this because of the convenience. Recent statistics published in one of the large American magazines indicated that ninety-eight per cent of the persons to whom credit had been extended by a well-known New York instalment house during a period covering over half a century, had made their payments. The remaining two per cent did not represent a loss, as most of these accounts had been settled after an extension of the original time had been granted. A marine engine business similarly conducted should prove equally as successful.

J. W. K., Jersey City, N. J.

### Complete Boat on Instalments a Necessity

IT would be well worth while to try selling marine engines on the instalment plan. The plan might well be extended to cover the complete boat, as possibly that would have a greater appeal and correspond to the completely equipped motor car.

With reasonable care a motor boat will last a long time and there should be no objection to one enjoying the sport for a year or two while paying for the boat.

If there was ever any doubt as to the value of the instalment plan the Liberty bond sales should forever remove that doubt. The plan encouraged thrift and enabled many to accumulate a snug capital in a relatively short time.

From the manufacturer's standpoint the instalment plan should be satisfactory, since the motor boat is insurable, must be registered and is generally used by responsible persons. Assuming, therefore, that the proposition is a safe one for the manufacturer, it only remains to perfect a plan that will attract the prospective buyer and at the same time not burden the manufacturer or dealer with expensive and cumbersome methods for carrying out the plan. The plan should include a substantial initial payment with a series of equal payments extending over a period not to exceed two years.

Undoubtedly the instalment plan would greatly increase the number of motor boat owners. New life would be added to the sport and the added numbers would eventually decrease costs of boating equipment. Boating clubs should derive proportional advantage from the increased number of owners.

Of course motor boating enjoys many natural advantages over the motor car, but there are still many things to do in the public interest of motor boating. Nothing increases interest and secures results like ownership. Many rural communities were opposed to good roads until the citizens of these communities became motor car owners.

I believe that the instalment plan would best be applied to the completely equipped motor boat, although it might be equally satisfactory for the sale of engines. Perhaps the manufacturer could best carry out such a scheme by working through a few large dealers. These dealers could extend the plan to smaller dealers according to local conditions.

L. R. L., Columbus, O.

## What to Do with Rusted Exhaust Connections

Valuable Tips on Separating a Corroded Exhaust Flange or Pipe from the Motor

Answers to the Following Prize Questions in the December Issue

*Describe and illustrate a satisfactory method of removing an exhaust pipe from the motor when, due to the processes of heat and rust, neither the pipe nor the nuts of the studs holding the flange respond to a wrench*

### Rusty Pipes and Studs Must Be Handled Carefully

AN exhaust pipe and exhaust pipe flange that will not respond to a wrench owing to the process of heat and rust on pipe and on nuts of the studs holding the flange can often be persuaded loose by slushing liberally with machine oil mixed with a little kerosene. This should be left to "soak" over night and will usually loosen scale and rust to such an extent that the offending parts can be removed without injuring studs or flange. If there is still a tendency to stick, a blow torch flame should be directed

against the flange so as to heat the flange without directly heating the pipe.

Expansion of the flange will usually loosen the same on the pipe sufficiently to start the pipe. I have used the heat method on refractory nuts in the same way, avoiding the difficulty of removing twisted-off studs.

Of course, the heating should be done quickly so as to avoid as much as possible heating the pipe or stud inside the flange or nut.

Where the above methods fail, the pipe can be removed in the following manner: Cut off the exhaust pipe with a hack saw about  $\frac{1}{4}$  inch from the face of the flange, as shown in Figure 3 of sketch herewith. Then locate, by inspection, the butt weld in the pipe, and with a heavy nail-set or key-drift placed at one side of the seam or weld, drive in the pipe toward the center, which will cause the seam to open up, as shown in the sketch, tearing loose the pipe from the rusted threads. In this way over half of the pipe can be hammered in, when a few blows on the remaining half will loosen it entirely. If the job is carefully done, no injury to the threads will result.

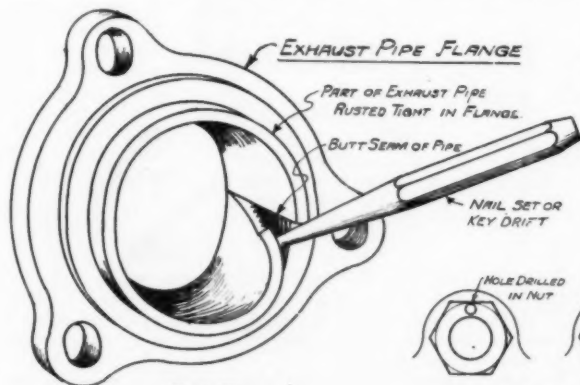


FIG 3.

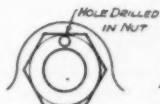


FIG. 1.

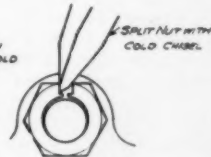
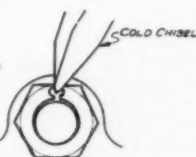


FIG 2.

Methods suggested by W. E. M. for removing rusted pipe from flange and for splitting nut from rusted or corroded stud bolts

For nuts on studs that do not respond to the oil and heat treatment, drill as large a hole as possible through the nut, as shown in Figure 1 of drawing. A couple of well-directed blows with a sharp cold chisel at the point where hole is drilled will split the nut, after which the latter can be still further spread open by driving the chisel a little farther into the split. A wrench will then find easy working. If a small drill is not available or the location of the nut be such that drilling the hole would be difficult, take a small cold chisel about  $\frac{1}{8}$  inch wide (or less) and cut a slot into the nut as shown in Figure 2 of drawing. Do not cut deep enough to injure the threads of the stud. Then with a tapered cold chisel, drive into the slot and split the nut where it may be easily removed. Of course, when the pipe has to be cut or the nuts split new parts will be necessary.

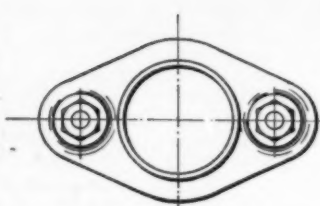
W. E. M., Philadelphia, Pa.

## Kerosene and Heat Might Help Before Cutting Is Tried

IF BOTH pipe and flange nuts are so rusted together that a wrench has no effect, the next best thing to do, before resorting to heroic measures, is to try the effects of kerosene and heat. Hammer all around the flange and bolts so as to loosen things a little, if possible, then pour kerosene over the flange and wrap a cloth or waste, soaked in kerosene, around the pipe and bolt heads and let stand over night. Then, next day, again hammer around the flange, but not so hard as to crack the castings, and try the wrench again. If things are still obstinate, heat up the parts with a blow torch, after cleaning up any free kerosene lying around, and again try to turn out the bolts or nuts and the pipe. If the parts hold fast after repeated attempts with coal oil and heat, proceed as shown in the sketches.

Cut out a section of the exhaust pipe with a hacksaw, leaving about an inch and a half of pipe still projecting from the flange (Figure 1). Or if there is an elbow near the engine, cut off this elbow. If the outboard end of the pipe can be removed, but one cut will be necessary, but more than likely this will be stuck, too, and a whole new pipe will have to be installed. The writer's personal experience with galvanized iron exhaust pipe is that such a pipe will not last over three years, in salt water, frequently considerably less; it does not pay to try to patch up an old corroded pipe, as it will soon eat through.

Next saw off the nuts or bolt heads (Figure 2). Sometimes



Pipe should be cut off close to exhaust flange according to H. H. P.

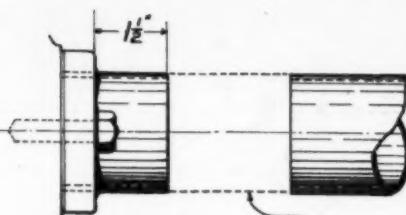


Fig. 1. Saw out section of pipe, or saw off elbow.

much of the rusting and sticking occurs between these nuts and the flange. File off any burrs remaining on the bolt stubs and insert a wide but narrow brass or steel wedge tool between the flange and gasket. It is better to damage the pipe flange than the cylinder casting. Work all around the flange and try to pry it loose over the studs but use care to pry it evenly so as not to crack the casting. If this operation is successful and the flange and pipe stub is pulled off, leaving the two studs in the cylinder flange, treat these with kerosene again and then try to turn them out with a small stillson wrench. If they come out, well and good; it will only be necessary to obtain new studs and nuts, or bolts. But if they only break off in the casting, all that can then be done is to drill them out, being extremely careful to drill exactly in the center of the studs, and retap. It would be best to use an oversize tap, or in some cases even the next size larger, unless one is so fortunate as to be able to break out the old bolt threads after drilling; for the tap, in all probability, would not follow the old threads.

(Continued on page 84)

## Loosening the Exhaust by Expansion

AFTER the exhaust line has been connected for several seasons, during which time the pipe or bolt threads have been subjected to a rusting and burning process, it sometimes seems impossible to loosen the connections. When you get up against the above conditions your first thoughts are inexpressible here, and then you think of a larger wrench or a piece of pipe over the handle. This might be all right on pipe, but don't do it on studs or cap screws, as you will be very apt to twist them off.

Hold a piece of babbit on the head and hit it several good blows with a heavy hammer. Strike in such a manner that the hammer does not rebound but holds close to the head. In obstinate cases omit the babbit and strike directly on the head.

If she still refuses to move heat the cap

screw or stud and the surrounding metal with a gasoline torch. When so hot that you cannot hold your hand on it press a piece of ice or cold steel against the head to contract the screw, thus breaking the rust, and try the wrench immediately.

In the case of a stud, hold a bar or heavy piece of iron under it to prevent bending the stud, and split the nut with a cold chisel, or you may be able to saw the sides off the nut. The cap screw head might be sawed off, and

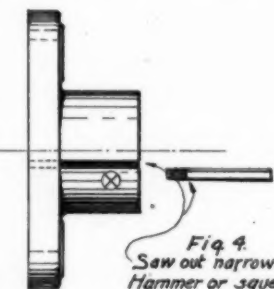


Fig. 4. Saw out narrow section of pipe. Hammer or squeeze at X.

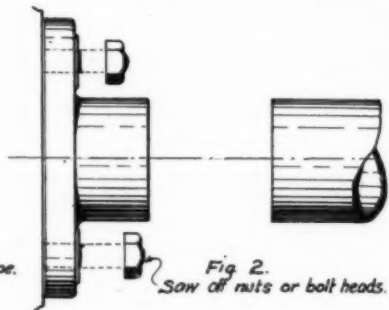


Fig. 2. Saw off nuts or bolt heads.

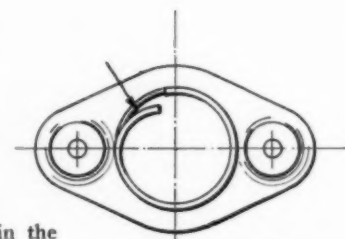


Fig. 5. Gradually roll pipe out of threads in flange.

H. H. P. says, as a last resort pipes and studs must be cut out

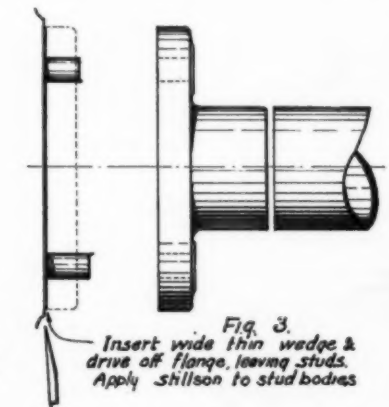
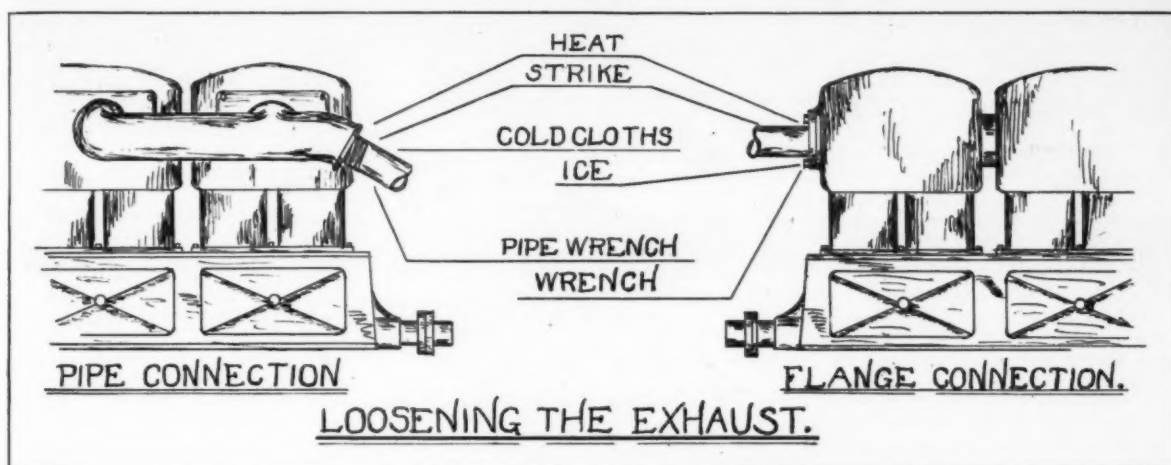


Fig. 3. Insert wide thin wedge & drive off flange, leaving studs. Apply stillson to stud bodies.





*W. B. M. illustrates points at which to apply heat and pressure to effect a cure*

when the flange is removed, the screw drilled until there is only a shell left, a square punch driven into the shell will generally turn it; the contraction of the shell and the heat from drilling having broken the rust. Should the thread in the motor be damaged there is generally enough metal to allow tapping a size larger.

Cast-iron pipe fittings may be broken by hammering, or if not broken the rust may be loosened by the pounding. When striking near the motor hold under the fitting or pipe to guard against breaking out the loss or motor connection. It is sometimes possible to collapse a nipple by hammering.

The heat and cold treatment may also be applied to pipe and fittings with equal results. Heat the pipe and fitting or motor connection and when hot wrap the pipe, close to the motor, with cloths soaked in ice water, and use the

wrench immediately, striking the pipe at the same time.

You can always get the exhaust pipe out of the motor by sawing it off about an inch from the connection and collapsing the remaining part with a vise. An iron pipe which has been in the exhaust line for several years, especially around salt water, will be so corroded and burned away that it will collapse easily.

While working on an obstinate pipe connection or stud remember that pipe screws and nuts are much cheaper than motor parts or welding jobs, and work in favor of the motor all the time.

When you make up these connections again coat the threads well with graphite pipe joint compound and they need not be made up as tight, neither will they rust or burn so that they cannot be loosened.

W. B. M., NEWBURGH, N. Y.

## Winter Care of the Mooring Explained

Some Methods Given Advise Leaving the Mooring Down and Others Would Raise It Up

Answers to the Following Prize Question in the December Issue

*Explain your method of caring for the mooring during the winter. Do you raise it up or mark it and how do you do it?*

### Favors Dropping Mooring in Fall

(The Prize-Winning Answer)

THE man who lifts his moorings every year is making a lot of hard, wet, cold, unnecessary work for himself that has not a single compensating feature. Old skippers invariably drop their moorings after removing the rope, and float and grapple for them in the spring. Not alone is this a great saving of labor, but metal continually under the water has very much less deterioration than when exposed to the atmosphere. So, as dropping your

mooring saves much labor and tends to preserve the metal much more than in any other way, no further argument is necessary. Yet there is another strong reason against lifting the mooring, which is, that a mushroom when first put overboard has little or no holding power till it has buried itself by working into the bottom. In the spring this is a serious matter, because that is a season of the year when strong winds are prevalent. A newly launched boat made fast to a mushroom just placed is a combination that needs watching, and storms do not always conveniently occur Saturday afternoons or Sunday. Then again, the

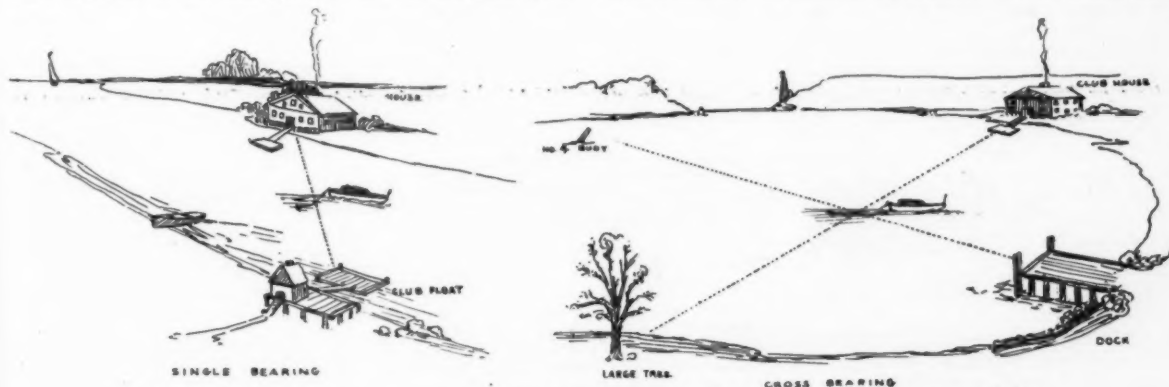


Fig. 1. Take suitable bearings or cross bearings on fixed objects before dropping mooring chains

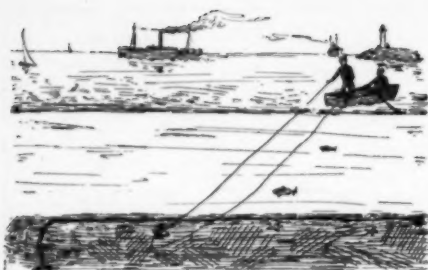


Fig. 2. A wire attached to the end of the mooring chain facilitates grappling



Fig. 3. How not to drop your mooring chain, in a bunch

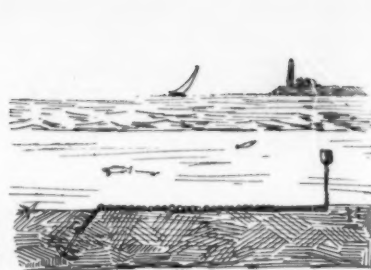


Fig. 4. A semi-submerged float is easily picked up by a drag line

boat freshly painted or the brightly varnished deck is not improved if used to set out a dirty, rusty mooring.

To the novice a dropped mooring seems like one lost, but it is much safer under a few feet of water than in the boat yard, and the locating of it when wanted is a most simple matter.

There are various ways of marking the location and the most frequently used is by means of a bearing. Suppose you moor in a reasonably small river or harbor—get a range line from two prominent objects, such as the club float and a house on the other shore, while your boat is at anchor; then draw a rough diagram like Figure 1, and don't lose the diagram. When it comes time to drop your mooring unshackle the rope, stretch the chain out taut at right angles to your range line, and let her go with a full knowledge it will be there when wanted. A piece of wire with a small rock or iron weight at the end to increase the length of the chain (see Figure 2) will make the location easier in the spring. To lift the mooring use a grapple, which is like a small anchor without stock but with several prongs and the operation of which from a rowboat is shown in illustration. Be sure to attach a trip line to bottom of grapple so in case it is caught in a rock or other obstruction it can be recovered by letting go the hauling line and pulling on the trip line. Do not use rope to lengthen your chain if any of the natives spear for eels, as they will be sure to catch your rope and cut it. If you moor bow and stern tie the two moorings together, but whatever you do don't drop the chain in a bunch as shown in Figure 3, because it is hard to find the exact location of so small a group. Another method is to attach a light rope to end of the chain with wood float painted white so that at mean low water it will be a few feet below surface, as shown in Figure 4. This will prevent it from freezing in the ice and being carried away, as well as keeping it out of the propeller of the average motor boat. However, I prefer, and have always used bearings to locate my ground tackle in the spring. Should your harbor be wide it is better to take two bearings instead of one and have them cross as near 90 degrees as possible.

But a mooring must be lifted sooner or later for examination of all its parts, particularly the ring of the mushroom, the shackles, links of chain, etc. How often this is necessary is a question, depending on various circumstances, such as age of tackle, comparative weight for size of boat, exposure of the harbor, resulting in hard use, etc. I always use about double the weight necessary throughout—rope, shackles, chain, and mushroom. It is the cheapest on both the pocketbook and the mind. I moor in a very sheltered harbor and when tackle is new I figure it will last four or five years without renewal of any metal parts. After this period I take it up for examination every third

year, and I never put down anything the least bit worn, on the theory "it will last another season." To lift your moorings a float or scow with hatch in center, uprights, and cross bar like Figure 5 is ideal. Catch on to your moorings at low tide, hauling chain up taut, and the rise of tide will do the rest. Few clubs or organizations have such an outfit and use two good size skiffs lashed together with a log or 4x4 joist between, as shown in Figure 5. In the absence of these hoist the mooring taut on the bow (see Figure 7), but if you do this, don't expect a cleat fastened to the deck by a couple of inch and a half screws to stand very much strain. And if you have a good winch or sampson post to make fast to, lash your chain in such a manner that if the moorings don't lift with the tide they can be cut loose and not pull the boat under.

One parting word of caution, whether lifting a mooring or putting it out, have all chain and rope coiled down neatly so it will run freely, and keep all volunteer helpers away from it, as more than one good sailor has gone to Davy Jones locker by getting his leg or arm fouled in a mooring.

H. A. J., NEW YORK, N. Y.

### Method of Raising the Mooring

**T**HERE are two ways of caring for a mooring during the winter; one, leaving it in the water and marking its location by means of cross bearings; and the other, raising it and storing it under cover.

Leaving it in the water is hardly a safe practice as a general thing, as the chain wears and rusts and if left too long without attention it is liable to give way in a blow. It might be safely left down for a year when it is new, but one great objection to leaving it down for more than one season is that it gradually works deeper and deeper so that when it is desired to raise it considerable work is required to loosen it from the bottom. For this reason it is advisable to take it up at the end of each season.

For a soft bottom, either mud or sand, the mushroom anchor is probably the best thing to use, as it will hold much more per pound of weight. It may be somewhat harder to start from the bottom, but once loosened it is more easily handled than a heavy block of concrete or anything similar.

When raising the mooring, it is best to select a calm day, of which there are usually quite a number in the fall. Haul up the cable until the bow of the boat is directly over the mooring and draw tight on it so as to pull the bow down, thus exerting a steady pull on the mooring. Working from the dink, stir up the bottom around the anchor by means of a stream of water pumped down

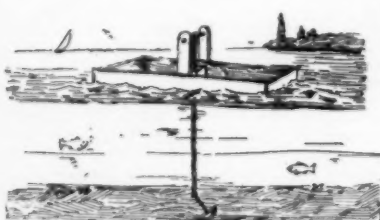


Fig. 5. A simple, convenient type of scow for handling moorings

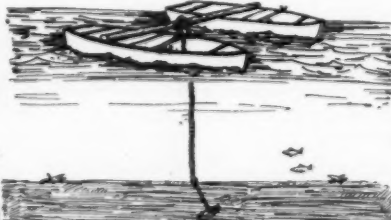


Fig. 6. Lashing two rowboats together is a good substitute

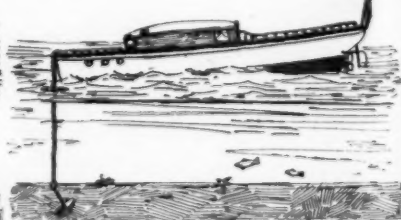
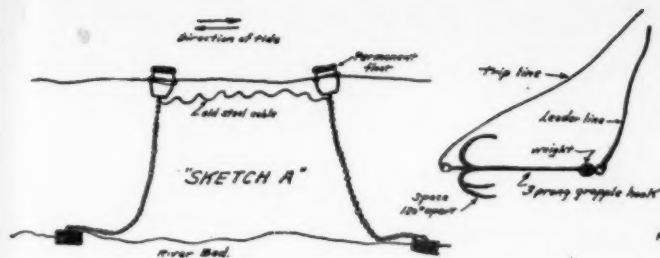
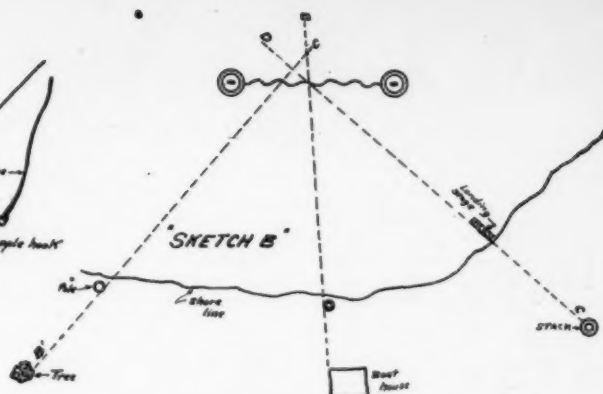


Fig. 7. Using the boat to raise the mooring requires caution and care



E. T. H. connects a pair of moorings and drops them in direction of the tide



Take as many bearings as possible

through a hose. This loosening of the bottom material in connection with the upward pull exerted by the boat will free the mooring very quickly.

The means of stirring up the bottom with a stream of water is at hand on most boats. A brass bilge pump having a discharge hose usually has force enough for the purpose. All that is necessary to convert it is to attach the hose to a piece of half-inch iron pipe of sufficient length to reach bottom. With this the mooring can be felt and the bottom loosened around it.

After the mooring is taken ashore, it is thoroughly cleaned of mud and sea growths and allowed to dry. If the galvanizing has worn off so that it is beginning to rust, the rusted places are scoured with a wire brush until bright and then given two coats of red lead paint, after which two coats of anti-fouling paint are applied to the whole.

If raised at the end of each season and given the proper care, a mooring will last for years. Each time it is taken up the chain and connections can be examined and any weak spots detected.

A. L. M., New York, N. Y.

### Take Bearings, Remove Float and Drop Chain

THE above method, if properly executed, is the best and easiest way to take care of the mooring during the winter season. Most boats are moored at yacht clubs or boat houses located in protected waters and with depths on mean low tide of from five to fifteen feet. The writer is a member of a yacht club where the fleet arrangement is governed by a harbor master and it is absolutely necessary that each member retain his position year after year so as to safeguard all other boats of the fleet. To do this the method of sinking the mooring as explained below is by far more simple and less expensive than attempting to raise it. As shown in sketch "A," two members club together—if this is not possible then a weight of about ten pounds may be attached to the other end of the steel cable shown and sunk in a line with the tide direction. First obtain a length of old steel cable about thirty feet long, make a number of kinks in this so that it will not entirely sink in the mud, securely attach this to the two mooring chains as shown. Next, before removing the floats, take as many bearings as the nature of the location will permit (Sketch B). The observer is assumed to be in a tender at Points CDB and on the basis that three points in line determine a straight line, bearings may be taken as shown. If the anchorage is in a river, bearings may be taken from both shores. Make a little chart of this and keep same in a place where you will be sure to locate it in the spring. Now you may detach both floats, drop the chain and cable, and stow the floats ashore. In the spring, after having first painted and thoroughly inspected the floats, the two members should equip themselves with a three or four-prong grapple hook with a trip rope as shown in the sketch. Row out to the approximate location, say along line "AB" until the intersection with lines "BC" or "CD" are reached.

So that it will not be necessary to continually check bearings, the writer takes as part of his equipment an old can, about twenty feet of hand line, and a small weight which is dropped at the bearing intersections. All that is

then necessary is for one man to row and the other to operate the grapple hook. Don't forget the trip rope, because if your hook should catch in the mooring chain close to the weight it will be necessary for you to slack away on the leader line and pull on the trip line to release the hook. By rowing back and forth several times close to the can marker your grapple hook will catch the chain or kinked steel cable and you can pull same to the surface. Hold on to the cable and work over to your can float, attach latter to the cable temporarily, row ashore for the permanent floats. Make these secure to their respective mooring chains, and after having stowed the steel cable and marker float safely away for next year your moorings are ready to receive the boat. In this manner you retain your exact location of the previous year. In the writer's opinion pulling up the mooring and resinking again in the spring is a laborious, expensive and unnecessary task, and should only be resorted to where mooring is on a bottom of shifting sands, or if the boat owner has a mushroom mooring and the boat is not moored in a fleet, such as at a yacht club. When purchasing a mooring have plenty of weight, a galvanized welded link chain just a little heavier than you think you require for your boat, and the best float, with protecting bumpers, is none too good.

E. T. H., Upper Darby, Pa.

### Uses Buoy Below Ice Line

WHATEVER is done for the winter, first be sure to fix the position of the anchor by "cross bearings" of fixed, permanent objects on shore. To obtain these bearings, haul the anchor chain up as short as possible, and thus get the boat directly over the anchor. Then sight on shore three or four clearly defined "ranges," where two distinct objects are in line with each other and with the boat, and write them down for future reference. While compass bearings could be used, these fixed ranges are better for the motor boatman with the average small-boat compass. Then, if in any way you drop the chain to the bottom, you have only to row out to a position where all those ranges sight true simultaneously, and drive a pole into the bottom. Then you can fish for the chain at leisure.

Unless the mooring anchor is very light, it is best to let it stay on bottom through all seasons. As to the mooring buoy, it depends on its shape and type whether or not it is safe to leave it in the water all winter. A barrel buoy floating on its side is likely to be torn away by moving ice of even a few inches thickness. A barrel floating end-up, however, if sunk so as to be barely awash, is comparatively safe from harm. The double conical-shaped galvanized steel buoy is quite likely to be torn away unless weighted to float almost entirely submerged, when they are comparatively safe. Spar buoys are safe if well tapered toward the top, and if weighted to sink nearly awash. The writer uses in summer a 12-foot spar buoy normally standing three feet out of water. This buoy withstands ice readily, but is removed from the water every second winter, to dry out. At such time a 30-gallon keg is substituted. A light ring on the top head is handy when

(Continued on page 80)



# My Ideal Auxiliary

No. 13, Euterpe—An 18-Foot Catboat with 4 H.P

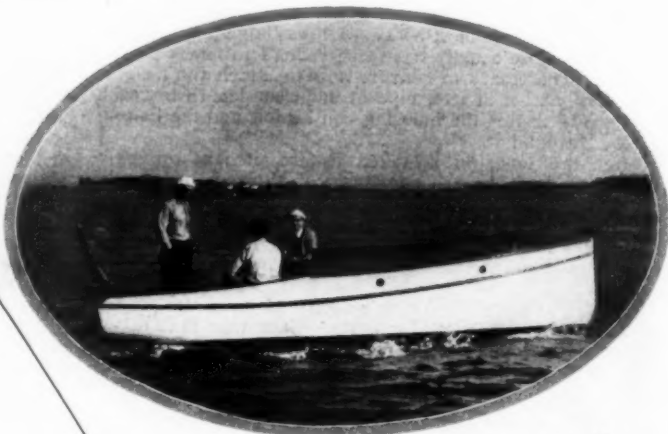
By A. J. Stadler

After announcing last month that the plans of Little Pal were the final ones of the Ideal Auxiliary Series we decided to give one more set, and Euterpe, a comfortable little catboat of 18 feet, is the final and last of the series.

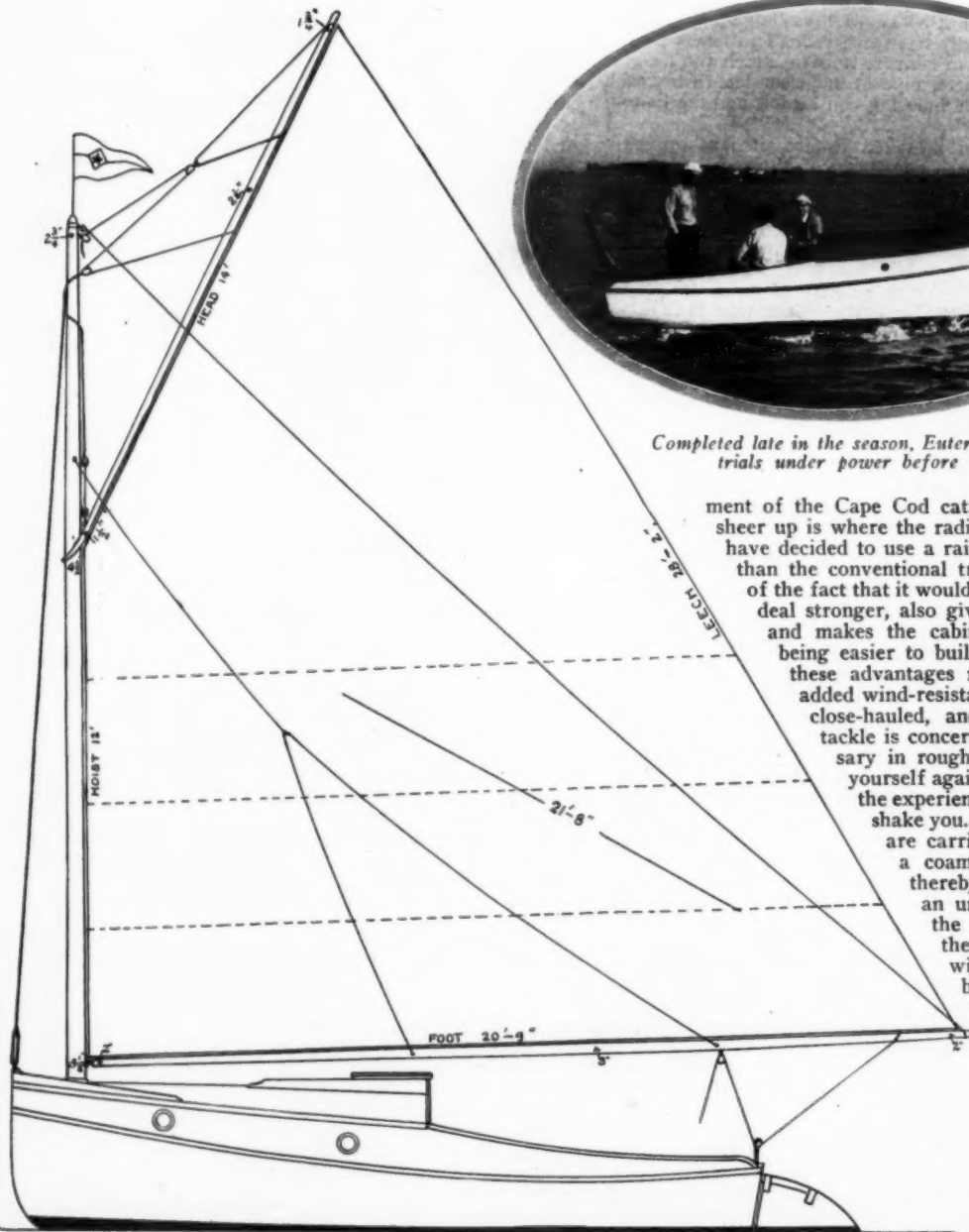
In the March issue we will reproduce the entire series of thirteen Ideal Auxiliaries and give our subscribers an opportunity to register their preference. The amateur designer whose plans receive the greatest number of votes will be awarded a prize of \$65 worth of boat equipment of his own selection.—Editor.

**I**N working out the plans for this big little boat my object was to develop a single hander which would have enough room for a couple of fellows to go cruising in, and at the same time, one that would be inexpensive enough to allow a fellow's pocketbook to meet the present high price of materials and still be roomy enough to carry a party of five or six for an afternoon's sail and seaworthy enough to weather an ordinary storm on the Sound.

Upon examination of the lines you will find that the bottom is in keeping with that of the present day develop-

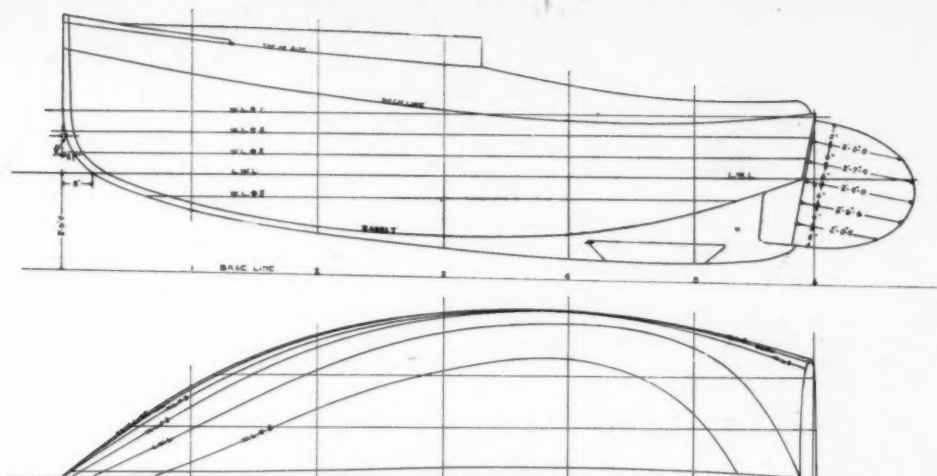


Completed late in the season, Euterpe was given a few trials under power before being rigged

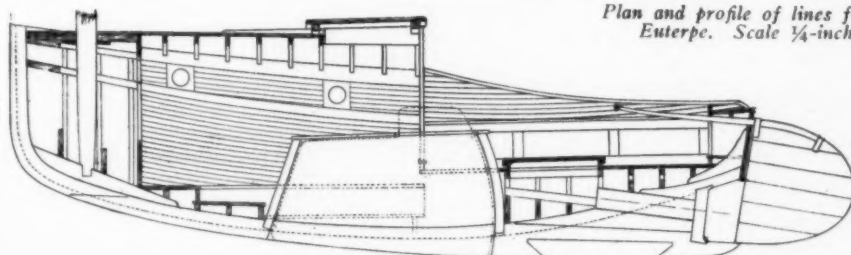


Outboard profile and sail plan of Euterpe. Scale  $\frac{3}{4}$ -inch equals 1-foot

ment of the Cape Cod cat, but from the plank sheer up is where the radical change occurs. I have decided to use a raised-deck cabin rather than the conventional trunk cabin by reason of the fact that it would make the bow a good deal stronger, also gives more room inside and makes the cabin rain-proof, besides being easier to build. I believe that all these advantages more than offset the added wind-resistance when sailing her close-hauled, and as far as ground tackle is concerned, all that is necessary in rough weather is to brace yourself against the mast and (like the experienced cowboy) she can't shake you. The sides of the boat are carried up so as to form a coaming for the cockpit, thereby giving the top side an unbroken sheer and at the same time making the cockpit a good deal wider than usual. The boat was launched in September, 1917, and because of the lateness of the season, I did not bother about putting a rig on her for that year, so I used her as a motor boat, and as such she makes about seven miles per hour, with a 4 h.p. Barker single-cylinder



Plan and profile of lines for 18-foot catboat Enterpe. Scale  $\frac{1}{4}$ -inch equals 1-foot



Inboard profile showing centerboard trunk. Scale  $\frac{1}{4}$ -inch equals 1-foot

two-cycle motor turning an 18 x 21-inch three-bladed propeller about 400 r.p.m. I did not use the boat last year because of my enlistment in the United States Navy, but now that I am back home in "civies" again, I expect to carry out my original plans and put a cat rig on her. On one occasion I tried her out on the Sound in a northeaster, and must say that she shows wonderful qualities of seaworthiness for a boat of her size, and she is as dry as a chip.

There is a large locker forward for hanging clothes, etc., and there is a small locker on each side of the forward cabin bulkhead for storing dishes, provisions,

TABLE OF OFFSETS

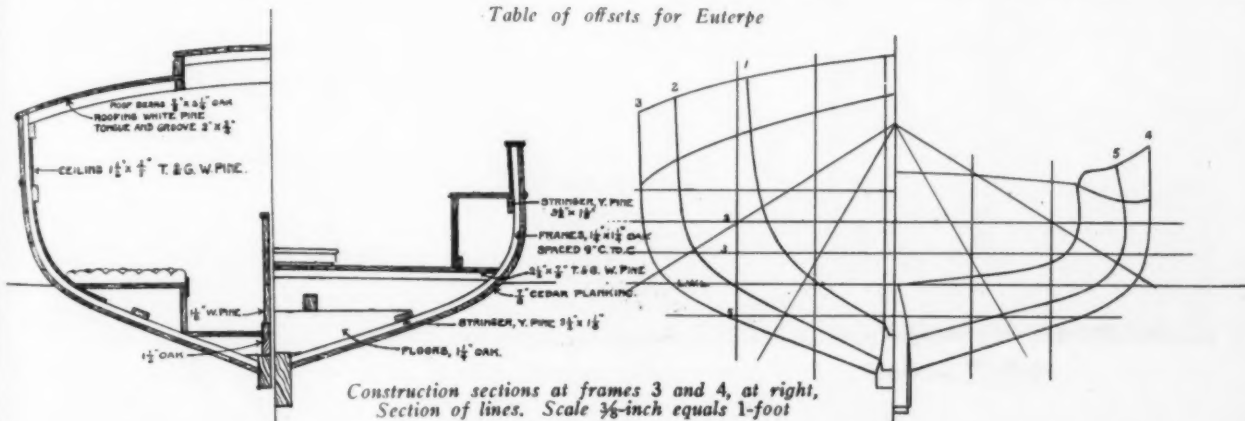
		STEM					TRANSOME
		1	2	3	4	5	
HALF BREADTHS.	DECK LINE	2-3-4	3-5-3	4-0-4	4-0-4	3-7-3	2-10-2
	WATER LINE #1	2-2-0	3-5-0	4-0-4			
	WATER LINE #2	2-0-1	3-4-1	4-0-0	4-0-3	3-7-6	2-11-1
	WATER LINE #3	1-8-5	3-1-5	3-10-5	3-11-5	3-7-0	2-8-9
	LOAD WATER LINE	1-2-3	2-7-0	3-6-3	3-9-0	3-2-1	0-0-6
HEIGHTS	WATER LINE #5	0-4-3	1-7-5	2-8-0	2-11-4	1-7-0	
	TOP OF SIDES	5-10-7	5-7-1	5-4-0	5-1-6	4-8-2	4-4-5
	DECK LINE	5-3-5	4-4-1	4-4-0	4-0-2	3-4-6	3-10-0
	RABBIT	1-8-1	1-2-0	1-0-2	1-1-1	1-8-1	2-6-0
	KEEL	1-6-1	0-11-6	0-8-5	0-6-3	0-5-7	

DIMENSIONS ARE GIVEN IN FEET, INCHES & EIGHTHS

etc., and in the center of the bulkhead there is a large door (with a beveled mirror built into it) which gives access to the forward locker. The after bulkhead follows the conventional catboat practice, with a three-foot-wide companionway, and on one side the W. C. is boxed in so as to act as a step for entering the cabin.

There is a lead casting bolted on the keel; this, I believe to be the right place for ballast, because you don't have the trouble of lifting it out of the boat every time you haul her out, and besides, when in such a position, it offers a more stabilizing effect than if it is placed inside. I, of course, am using

Table of offsets for Enterpe

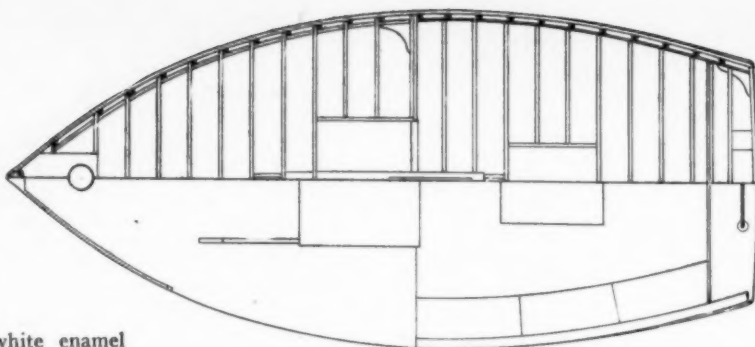


Construction sections at frames 3 and 4, at right. Section of lines. Scale  $\frac{3}{16}$ -inch equals 1-foot

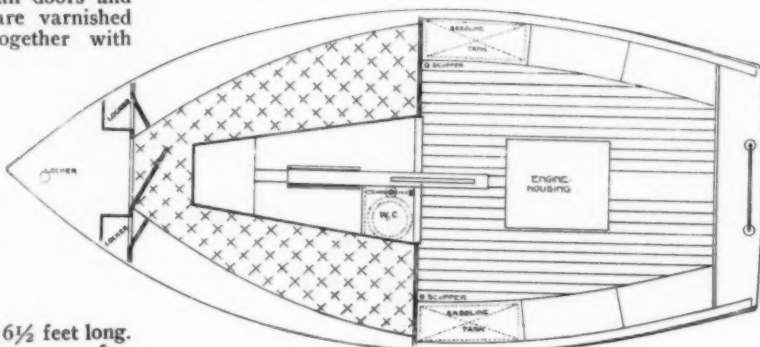
some pigs of lead inside to trim her.

The cockpit floor and all seat tops are painted with a lead color, while the outside of the after cabin bulkhead and the cockpit seat fronts are varnished oak, the companionway and doors are varnished mahogany, and the cabin interior is finished in white enamel with a slight greenish tint, the roof a flat white, and the carlins are of varnished oak, and all doors and trim in the cabin are varnished mahogany. This, together with sea-green corduroy cushions, makes a very handsome little cabin, and a comfortable one at that, because you don't have the deck sticking in the way of your neck, if you want to lean back a little, and what's more, the bunks average 2

feet in width and are 6½ feet long. It was found necessary after the boat had been in service a short



Beam plan and deck plan of Euterpe



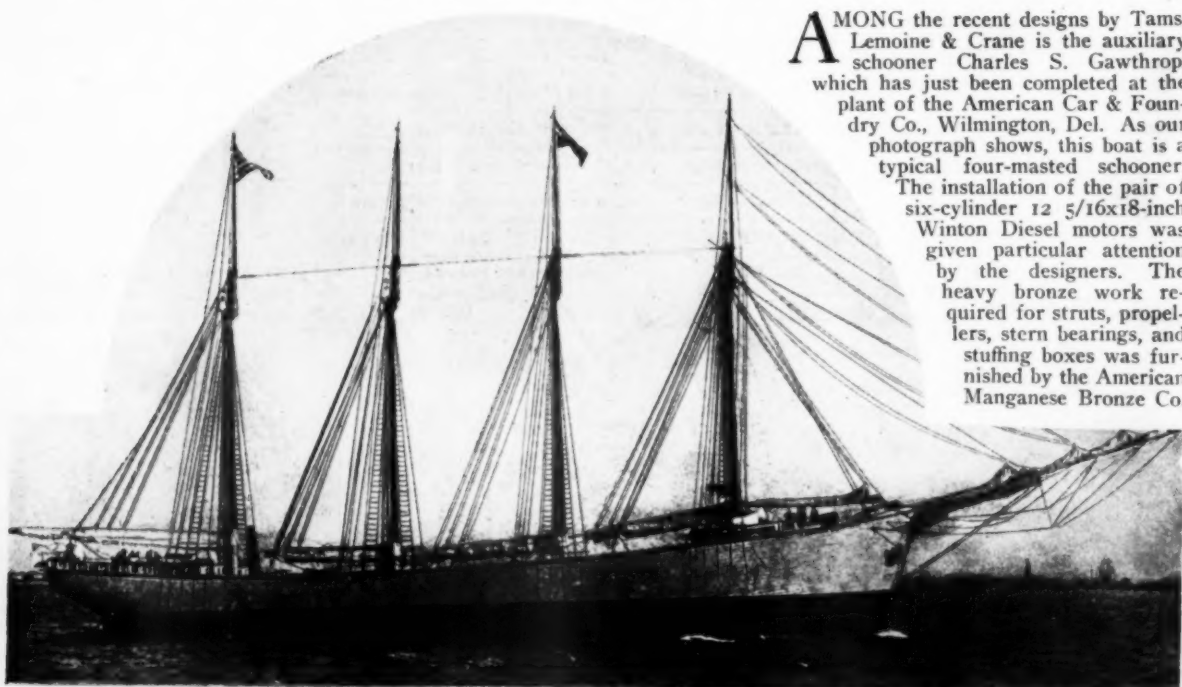
Arrangement plan. Scale ¼-inch equals 1 foot

time to install a ventilator on the cabin roof over the large locker forward, because I found the locker to be very stuffy after having the cabin closed for a week, and besides, I noticed that the seams in the roofing showed very prominently from the bow to the forward cabin bulkhead, which was caused by too much moisture in the interior, and the hot sun beating down on the outside. The cabin doors have three slats placed in them instead of a small upper panel, the effect being that of a wooden shutter, and now, between the ventilator forward and the openings for air in the cabin doors, I find the entire interior to be well ventilated at all times.

## Chas. S. Gawthrop, an American-Built Auxiliary

Typical of the Modern Development in Auxiliary Vessels Is This American Car & Foundry Company's Schooner Powered with Winton Engines

**A**MONG the recent designs by Tams, Lemoine & Crane is the auxiliary schooner Charles S. Gawthrop, which has just been completed at the plant of the American Car & Foundry Co., Wilmington, Del. As our photograph shows, this boat is a typical four-masted schooner. The installation of the pair of six-cylinder 12 5/16x18-inch Winton Diesel motors was given particular attention by the designers. The heavy bronze work required for struts, propellers, stern bearings, and stuffing boxes was furnished by the American Manganese Bronze Co.



On her trials the Charles S. Gawthrop was handled and maneuvered very effectively by the use of the Winton oil engines alone



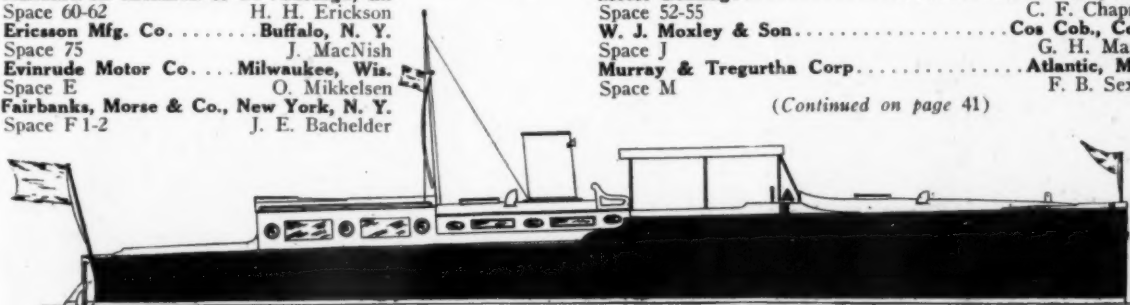
# Exhibitors at the 1920 Motor Boat Show

In the list below will be found the names and addresses in alphabetical order of all the boat, engine, and accessories exhibitors at the National Motor Boat Ship & Engine Show held at the Grand Central Palace, New York City, February 20-28, 1920.

The space occupied by each exhibitor is mentioned, as are the names of the individuals in charge of the particular exhibits, forming a valuable guide and directory to the entire show.

<b>The A-C Electrical Mfg. Co.</b> .....	Dayton, Ohio	<b>Fay &amp; Bowen Engine Co.</b> .....	Geneva, N. Y.
Space 34	R. H. Croninger	Space A 1	W. L. Fay
<b>Aeromarine Plane &amp; Motor Co.</b> .....	Keyport, N. J.	<b>Fire Gun Mfg. Co., Inc.</b> .....	New York, N. Y.
Space A 7	E. de B. Newman	Space 36	E. F. Delfoe
<b>Albany Boat Corporation</b> .....	Watervliet, N. Y.	<b>The Francke Co.</b> .....	New York, N. Y.
Space A 7	L. L. Tripp	Space 50	R. A. Smith
<b>The Allen Corporation</b> .....	New York, N. Y.	<b>The Frisbie Motor Co.</b> .....	Middletown, Conn.
Space 13	E. M. Sterns	Space E	W. E. Gibbs
<b>American Balsa Company, Inc.</b> .....	New York, N. Y.	<b>Generator Valve Co.</b> .....	Brooklyn, N. Y.
Space B 5	A. Von Schrenk	Space 39	J. James
<b>American Bosch Magneto Corp.</b> .....	Springfield, Mass.	<b>Chas. H. Gillespie &amp; Sons</b> .....	New York, N. Y.
Space 90	A. H. Bartsch, C. F. Graesser	Space 82	L. H. Kronfeld
<b>Bennett &amp; Watts Corp.</b> .....	New York, N. Y.	<b>Gray Motor Co.</b> .....	Detroit, Mich.
Space 70	R. A. McCormack	Space G 1	W. C. Disbrow
<b>Bowler, Holmes &amp; Hecker Co.</b> .....	New York, N. Y.	<b>Gray &amp; Prior Machine Co.</b> .....	Hartford, Conn.
Space E		Space K	John L. Shellington
<b>The Bridgeport Motor Co., Inc.</b> .....	Bridgeport, Conn.	<b>Hall-Scott Motor Car Co., Inc.</b> .....	Berkeley, Cal.
Space E	H. H. Brautigan	Space D 1-2	A. J. Utz, J. G. Robinson
<b>Brooklyn Varnish Mfg. Co.</b> .....	Brooklyn, N. Y.	<b>Higgins &amp; Seiter, Inc.</b> .....	New York, N. Y.
Space 26	C. B. Andrews, D. C. Anderson	Space 44	R. Goethius
<b>Cape Cod Shipbuilding Corp.</b> .....	Wareham, Mass.	<b>Hyde Windlass Company</b> .....	Bath, Me.
Space A 6	C. S. Gurney	Space H	F. L. Andrews
<b>The Carlyle Johnson Machine Co.</b> .....	Manchester, Conn.	<b>Ideal Engine Co., Inc.</b> .....	Norfolk, Va.
Space K	S. H. Simon	Space 82	C. W. Dean
<b>Geo. B. Carpenter &amp; Co.</b> .....	Chicago, Ill.	<b>International Shipbuilding &amp; Marine Engineering Corp.</b> .....	Nyack, N. Y.
Space 41	F. S. Wood	Space A 4	F. M. Hartman
<b>Champion Spark Plug Co.</b> .....	Cleveland, Ohio	<b>The J. V. B. Engine Co.</b> .....	Akron, Ohio
Space 33	C. L. Corwin	Space E	J. Van Blerck
<b>Chicago Varnish Company</b> .....	Chicago, Ill.	<b>Kermath Mfg. Co.</b> .....	Detroit, Mich.
Space 35	Theo. Meyer	Space K	J. B. Farr
<b>The Clay Engine Mfg. Co.</b> .....	Cleveland, Ohio	<b>Knox Motors Associates</b> .....	Springfield, Mass.
Space N	J. N. Halle	Space 58	E. J. Stone
<b>Columbian Bronze Corp.</b> .....	New York, N. Y.	<b>L. O. Koven &amp; Bro.</b> .....	Jersey City, N. J.
Space L	L. J. Hall	Space 43-45	L. O. Koven
<b>Consolidated Shipbuilding Corp.</b> .....	New York, N. Y.	<b>J. W. Lathrop Engine Co., Inc.</b> .....	Mystic, Conn.
Space A 2-3	John J. Amory	Space C	
<b>Cutting &amp; Washington Radio Corp.</b> .....	New York, N. Y.	<b>Geo. Lawley &amp; Son Corp.</b> .....	Boston, Mass.
Space 17	J. P. Johnston	Space B 1	G. F. Lawley
<b>The Debevoise Company</b> .....	Brooklyn, N. Y.	<b>The Leece-Neville Co.</b> .....	Cleveland, Ohio
Space 29	H. Wilkinson	Space 24	G. S. Cole
<b>Delaware Marine Motors Co.</b> .....	Wilmington, Del.	<b>Luders Marine Construction Co.</b> .....	Stamford, Conn.
Space C	Parke Ross	Space A 5	A. E. Luders, G. S. Cole
<b>De Lisser Mfg. &amp; Export Corp.</b> .....	New York, N. Y.	<b>Lewis Motor Mfg. Co.</b> .....	Fostoria, Ohio
Space 84	Mark de Lisser	Space G 2	Parr-Loichot
<b>The H. C. Doman Co.</b> .....	Oshkosh, Wis.	<b>McCord Mfg. Co.</b> .....	Detroit, Mich.
Space K	R. K. Schriber, Harry Johnson	Space 77	J. A. Holle
<b>Domestic Electric Co., Inc.</b> .....	New York, N. Y.	<b>The G. H. Masten Co., Inc.</b> .....	New York, N. Y.
Space 14-15	O. C. Olsen	Space J	G. H. Masten
<b>C. D. Durkee &amp; Co., Inc.</b> .....	New York, N. Y.	<b>The Mianus Motor Works</b> .....	Stamford, Conn.
Space 92	J. Hossack	Space B 6	N. A. Holstrom
<b>Eisemann Magneto Co.</b> .....	Brooklyn, N. Y.	<b>Monarch Valve Co.</b> .....	Brooklyn, N. Y.
Space 78-79-80-81	E. S. Clark	Space 25	J. A. Murray
<b>The Elco Works</b> .....	Bayonne, N. J.	<b>The Moto-Meter Co., Inc.</b> .....	Long Island City, N. Y.
Space B 2-3	H. R. Sutphen	Space 86	H. T. Boyce
<b>Hubbard H. Erickson &amp; Co.</b> .....	Chicago, Ill.	<b>Motor Boating</b> .....	New York, N. Y.
Space 60-62	H. H. Erickson	Space 52-55	C. F. Chapman
<b>Erickson Mfg. Co.</b> .....	Buffalo, N. Y.	<b>W. J. Moxley &amp; Son</b> .....	Cos Cob, Conn.
Space 75	J. MacNish	Space J	G. H. Masten
<b>Evinrude Motor Co.</b> .....	Milwaukee, Wis.	<b>Murray &amp; Tregurtha Corp.</b> .....	Atlantic, Mass.
Space E	O. Mikkelsen	Space M	F. B. Sexton
<b>Fairbanks, Morse &amp; Co., New York, N. Y.</b> .....	New York, N. Y.		
Space F 1-2	J. E. Bachelder		

(Continued on page 41)



Profile view of the 50-foot express cruiser exhibited by the Luders Marine Construction Co. This fine example of yacht building is to be powered with two of the new model GR Sterling motors having a total horsepower in excess of 600. Speed is expected to be 35 m.p.h.

# What You Will Find at the 1920 Show

An Unusually Interesting Display of Motor Boats, Marine Engines, and Accessories of All Kinds Assembled for the Inspection of the Critical Enthusiast—Descriptions of Representative Exhibits Shown at the Grand Central Palace

Thousands of motor boatmen throughout the country who look forward to the Motor Boat Show at the launching of the new season, are for one reason or another unable to be present in person when the crowds pour in at the doors of the Grand Central Palace. But they are just as interested in the big boating event as the more fortunate fans who are able to inspect the engines, hulls and fittings at short range. This year, when the Show resumes after a lapse brought about by post-war conditions, the interest

of the boating fraternity is more intensified than ever, and from present indications the Show which is ushered in on February 20 and continues until the 28, will be much more successful than any of its predecessors. For this reason we take a great deal of pleasure in presenting for the benefit of readers, both present and absent, a synopsis of the exhibits which will be found within the four walls of the Palace. A complete list of exhibitors, with names of representatives in charge, will be found on page 37.

THE most important and interesting feature of the exhibit of the **Mianus Motor Wks.**, of Stamford, Conn., is the new Mianus heavy-oil engine. This line is represented by a 30 h.p. double-cylinder heavy-oil engine and a 7½ h.p. single-cylinder heavy-oil engine. The single-cylinder machine of small power is a distinct innovation in this type of motor. It is claimed that the device used for gasifying the heavy oil makes it possible to secure the same efficiency in the small powers as in the large motors and to show the same fuel economy in a 7½ h.p. machine as in one of 100 h.p. or over.

Following its usual custom the **Mianus Motor Wks.** is showing a regulation Mianus-powered lifeboat, and this year's craft is declared to be the last word in boats of this sort. As displayed in space B-6 the boat is completely equipped in every respect, with life lines, water breakers, and water-tight receptacles for food, oil, and matches. It is powered with a Mianus 10 h.p. two-cylinder, two-cycle engine—the Lifeboat Special—and has a capacity for thirty-four passengers.

In addition to the above the following motors are shown: The single-cylinder gasoline and kerosene type in 3, 5, and 7½ h.p., and the two-cylinder in 6 and 10 h.p.

The **Toppan Boat Mfg. Co.**, of Medford, Mass., is featuring one of its latest type 22-foot dories equipped with a 9-12 h.p. Universal four-cylinder motor. The boat is smooth-planked and has lockered seats, brass fittings, spray hood and apron, set of kapok-filled pillows and is a fine looking and comfortable sea boat. Capable of carrying twelve to fifteen persons, this boat is sold for \$1,000. Another dory in the Toppan line which is on exhibition at the Show is an 18-footer equipped with a 3 h.p. Palmer engine. Since this boat can be sailed, rowed, or propelled with power it is given the soubriquet of the Three-in-One power dory. It is a light draft little sea boat priced at \$375. A third boat on display is a 16-foot Hydroplane Bullet, equipped with a 9-12 h.p. Universal four-cylinder engine, auto type steering wheel and Stewart vacuum tank. This boat, which is priced at \$600, has a speed of 16 m.p.h. and will carry four persons. A 10-foot yacht tender with natural finished seats, trimmings and gunwales is also shown.

Three of the standardized boats of the **Elco Wks.**, of Bayonne, N. J., are on exhibit at the Show this year. The first of these is the Elco Cruisette, which shows several improvements over the old models; the second is a 36-foot Elco Express, which has held a position of

prominence in the boating world for the last sixteen years, and the third is the 50-foot Elco Cruiser. This 50-footer has been much improved, having a larger saloon with windows in place of ports, a bridge-deck enclosure with interchangeable windows ready for instant use as protection from wind and weather and other features which make for convenience and comfort. The cruiser is equipped with a new type 75 h.p. four-cylinder Standard engine having overhead valves, water-cooled crankshaft bearings, and jump spark ignition. A speed of 13 m.p.h. is guaranteed.

The Cruisette is unique in that it is designed to receive a cabin, standing roof, or in fact



Overhead electric light cluster for motor craft exhibited by A. C. Electrical Mfg. Co.

any form of upper works the purchaser may desire to put upon it. This can be done at the Elco yard or any local mechanic can convert the open model into the type which pleases the purchaser's fancy without any changes to the hull, decks, engine installation, steering gear, etc. The Cruisette is equipped with the new J. V. B. 36 h.p. motor which gives an actual speed of 13 m.p.h.

The 36-foot Express has been slowly and carefully developed into a beautiful piece of workmanship of graceful lines and excellent performance. The new model is equipped with an Elco 100 h.p. engine with electric self-starter and lighting plant and necessary equipment. A speed of 26 m.p.h. is guaranteed.

Of paramount importance among the many engines exhibited by the **Sterling Engine Co.**, of Buffalo, N. Y., is the new overhead dual-valve engine. Model GR, shown in two sizes, the six- and the eight-cylinder. The eight-cylinder machine is a 300 h.p. engine with 54-inch bore by 64-inch stroke equipped with manganese bronze upper crankcase and various other features peculiar to Sterling motors. The six-cylinder engine, having the same bore and stroke, develops 200 h.p. at 1,500 r.p.m. A sectional mounting of one of these motors is also shown. These are the overhead dual-valve Sterlings which have been developed during the past season and which are declared to operate on a fuel efficiency not surpassed by any other motor. In addition to the GR models

the following motors are being shown: A model FH 25-35 h.p. motor; a model FM 120-170 h.p. motor; a model F 300 h.p. dual-valve engine of the type powering Conejo, which has a speed of over 31 m.p.h.; a model D 12-15 h.p. engine intended for fishermen and small heavy cruisers and work boats; one of the model FC six-cylinder 130-145 h.p. motors which are built for driving electric generators and centrifugal pumps; and a model E 17-25 h.p. light cruiser and runabout engine.

The company is represented this year by the president, Mr. C. A. Crique; Mr. J. L. Killean, sales manager, and Mr. Morris E. Mutchler, advertising manager. Mr. Mutchler is in charge. Sterlings are exhibited in Space E.

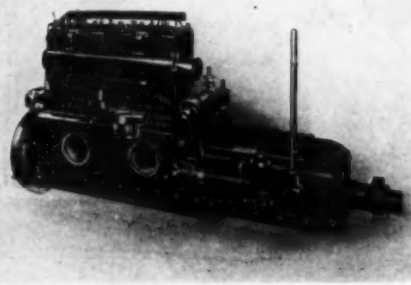
The **Consolidated Shipbuilding Corp.**, of Morris Heights, New York City, is exhibiting a variety of boats comprising the following models: A 40-foot speedster, a 32-foot mahogany runabout, 30-foot coupe yacht tender, and a 21-foot yacht tender. Of the Speedway line of marine motors, the following models are shown: Four-cylinder 4x4½-inch, six-cylinder 4½x5½-inch, four-, six-, and eight-cylinder 5¾x7-inch, and six-cylinder 6¾x8½-inch.

The 40-foot Speedster is a luxurious craft particularly adapted for fast ferry service and day sailing. It is arranged with enclosed cockpit forward, motor compartment amidships, and open cockpit aft. The construction is of the finest throughout with mahogany decks and planking, copper fastenings and fuel tanks, four water-tight bulkheads, etc. A 200 h.p. eight-cylinder Speedway motor gives a speed of 27 m.p.h. The 32-foot mahogany Runabout is of equally fine construction and is equipped with 150 h.p. motor which develops a speed of 22 m.p.h. The arrangement provides for an unusually large and comfortable cockpit allowing space for four wicker chairs between the steerman's seat and the seat at the after end of the cockpit. The lines of the 30-foot Coupe Yacht Tender are especially designed to give a clean running, seaworthy, dry, and steady model. The principal feature of this tender is the shelter cabin over part of the owner's cockpit which is fitted with plate glass windows and gives perfect protection from wind, rain or spray. The 21-foot Yacht Tender is an excellent little craft of the open type which develops a speed of 15 m.p.h.

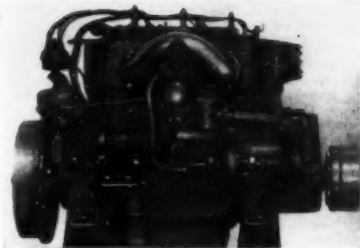
Typical of the quality of workmanship entering into the construction of Speedway engines is the six-cylinder 6¾x8½-inch heavy-duty machine exhibited at the Show. This motor develops its rated 115 h.p. at 600 r.p.m. and is a quiet running, oil-tight job incor-



The 21-foot yacht tender shown by the Consolidated Shipbuilding Corp.



Model D four-cylinder Gray-Prior motor equipped electric starting set



Model L four-cylinder Van Blerck commercial engine used with pumping sets

porating the latest developments of merit in the gasoline engine field. It is a unit power plant with clean lines and perfect accessibility and while not excessive in weight is strongly built and webbed to resist vibration.

R. W. Zundel Co., Inc., is showing a representative line of its marine hardware specialties. Among the items especially featured are the following: Zundel's loud sounding marine horn, Henricks generators and magnetos, Wizard magnetos, Marko storage batteries; Perlex spark plugs; Columbia Hot Shot motor boat battery; Lobec circulation and bilge pumps; Maxim silencers, Pequet bilge pumps, alcohol and kerosene stoves, ship's clocks and barometers. The Zundel exhibit is located in front of the elevators on the second floor.

The Van Blerck Motor Co., of Monroe, Mich., is showing one each of its four-, six-, and eight-cylinder model H marine motors, in the standard finish of black and nickel. These motors are constructed for use in the finest types of runabouts, cruisers, and express cruisers, and are designed to give the unfailing and satisfactory service which an owner expects from a modern power plant. They are equipped with the Leece-Neville two-unit starting and lighting system and Van Blerck-Paragon reverse gear integral with the motor, and all moving parts are enclosed. The crankshaft is of the counterbalanced type in accordance with the best precepts of modern engineering practice, and the other features of the motor are in accord. A model L four-cylinder commercial engine is also shown.

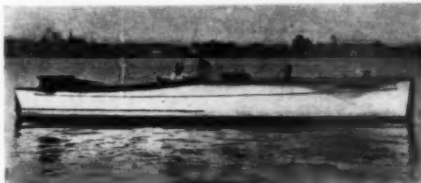
In the exhibit of Geo. Lawley & Co. may be seen an M6 Van Blerck motor installed in a 36-foot Sedan runabout. This boat is double-planked and is finished in solid mahogany with silk mohair upholstery and regular automobile control. A speed of 30 m.p.h. is maintained.

Mr. J. H. Mayne is in charge of the exhibit and Messrs. C. Cohron, J. L. Trenholm, and C. Bagg are in attendance.

The exhibit of the Columbian Bronze Corp., of Freeport, L. I., is located in Block L and comprises a line of propellers, struts, rudders, stuffing boxes, stern bearings, and shaftlogs. In addition to this there is a bronze blade and hub of a propeller 15 feet in diameter to illustrate the growth of the company's business in equipment for sea-going vessels. Completing the display there is an assortment of equipment in the motor ship line, several sizes of propellers, shaftlogs, etc., being shown. The exhibit is in charge of Mr. Wilbur H. Young, vice-president.

The H. C. Doman Co., of Oshkosh, Wis., is showing in Space K a complete line of four-cycle Doman marine engines consisting of the following models: Single-cylinder 5-7 h.p. fish boat engine with 5-inch bore and 6-inch stroke; single-cylinder 5 h.p. lifeboat engine with 5-inch bore and 6-inch stroke; two-cylinder 4 1/2 x 6-inch 12-15 h.p. motor; four-cylinder 4 1/2 x 6-inch 25-30 h.p.; and four-cylinder 6 x 7-inch 40-50 h.p. heavy-duty.

Geo. B. Carpenter & Co., of Chicago, Ill., are not making any exhibit of goods or appliances at this year's Show. They have taken a small



Fay & Bowen raised-deck runabout with high freeboard forward

booth, however, where Mr. Stanley Wood and Mr. W. J. Sackrider are on hand to meet old friends and make new acquaintances.

The Debevoise Co., of Brooklyn, N. Y., is featuring especially its well-known paint, Marine Flat White, which is compounded for all exterior motor boat painting. Fulton red and brown copper paints which are made with a maximum of copper metal and other poisons that are effective in the prevention of marine growth are exhibited, and the company is also demonstrating its other marine paints for all motor boat purposes. Mr. Frank W. Tibben has charge of the Debevoise booth and Capt. James F. Winans, Capt. Frank Day, and Messrs. Thos. C. Wiswall, Wm. H. Starbuck, Arthur M. Mitchell, and Ralph W. Chrystie are in attendance.

In Section C at the Palace the Regal Gasoline Engine Co., of Coldwater, Mich., is exhibiting the following marine motors: A single-cylinder 2 h.p. model Y; an 18 h.p. model JB with two cylinders; and in the four-cylinder type the models UC and EC, developing 20 and 30 h.p. respectively. A 3/4 K.W. Regalite electric lighting plant is also shown.

The J. H. Curtiss Co., Inc., of New York City, occupies Spaces 1 and 2 on the accessory floor with an unusually complete assortment of bathroom requisites, yacht toilets, and lavatories. Every article of sanitary equipment



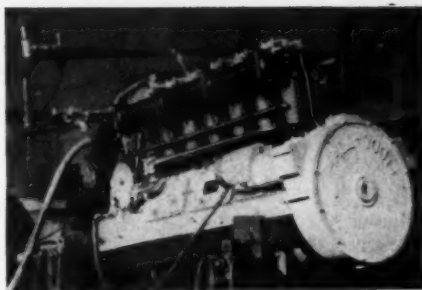
The distance model of the Boyce Moto-Meter for motor craft

for motor boats is displayed and the Curtiss people invite their friends to follow up the strains of the Hungarian Band which is stationed nearby and learn for themselves how a boat should be outfitted.

The Knox Motors Associates, of Springfield, Mass., have engaged Space 58 on the mezzanine floor in which they are exhibiting the Knox 40 h.p. valve-in-head marine engine on a display stand. Another feature of the exhibit is a board to which are attached a few Knox parts which are illustrative of the accessibility of this type of motor. Mr. E. J. Stone is in charge of the booth.

The Moto-Meter Co., Inc., of Long Island City, is demonstrating its model A type of Boyce Moto-Meter for marine engines. The model A consists of a handsomely finished black enamel case 3 1/2 inches in diameter, nickel-plated retaining rings, double crystal, white dial with red figures, and red and white pointer. The thermometer range is from 32° to 212° F., and the instrument is designed to indicate the temperature of the water leaving the cylinder jackets at any point within 30 feet of the motor. With this information and by the simple introduction of a three-way cock any motor boat owner can control the temperature of his motor at all times and by so doing add to its efficiency. Mr. H. T. Boyce is in charge of the exhibit.

In Block J on the main floor the C. H. Master Co., Inc., of New York City, is displaying in connection with its own exhibit of pleasure and commercial boats and general marine supplies the goods of the following manufacturers: The Ulster Foundry Corp., manufacturers of heavy hardware for ships; the Niagara Motors Corp., maker of Niagara four-cycle gasoline engines; the Arrow Motor & Machine



Six-cylinder Hall-Scott marine engine, with overhead valves and camshaft

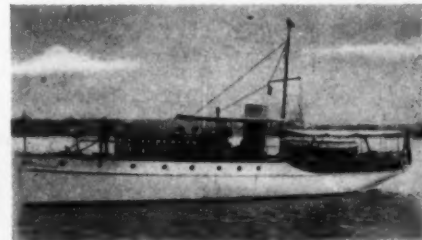
Co., which produces the Waterman outboard motor; the Vulcan Engine Wks., manufacturers of medium- and heavy-duty engines; the Caille Perfection Motor Co., and the Bryant & Berry Propeller Co.

The Gray & Prior Machine Co., of Hartford, Conn., is exhibiting one of its Gray-Prior model D four-cylinder, four-cycle engines equipped with Leece-Neville electric starting- and lighting system. A sectional engine which shows the internal construction of the Hartford two-cycle line is also exhibited. Mr. John L. Shelington is in charge of the display.

The American Balsa Co., Inc., of New York City, is confining its display this year to a 26-foot decked lifeboat of the Lundin type. The boat is of sturdy design and of the best workmanship throughout and the shell is divided by bulkheads into four water-tight compartments, any one of which may be stove in and filled with water without sinking the boat. The construction is so strong, the draft so shallow, and the propeller so well protected by the tunneled stern that the Lundin lifeboat can safely withstand the roughest usage among logs, snags, and rocks. The engine, which propels the boat at a speed of from 8 to 9 m.p.h., is a 25 h.p. Auto-Marine Standard motor. Mr. J. E. Batchelder has charge of the exhibit.

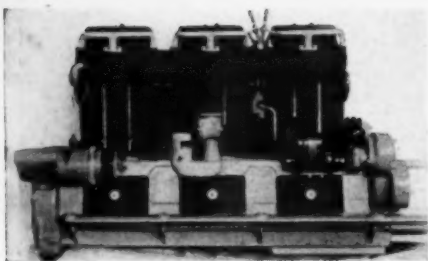
Occupying the north half of Block L on the Lexington Avenue side of the Palace the Wolverine Motor Wks., Inc., of Bridgeport, Conn., is displaying the following marine motors: A six-cylinder 11 x 12-inch four-cycle engine equipped to use kerosene oil as fuel; a three-cylinder 32 h.p. 7 1/2 x 10-inch motor with complete kerosene equipment, and a four-cylinder 35-40 h.p. gasoline engine. The system of ignition on these engines is the high-tension jump spark with batteries for starting and magneto and coil of the latest improved design. The engines are of the enclosed base type and are equipped with mechanical lubricators and Wolverine reverse gears. Special features of these motors are simplicity of design and construction and accessibility of all working parts. The six-cylinder machine is equipped with electric starter.

With four of its motors on display, the Red Wing Motor Co., of Red Wing, Minn., is exhibiting a representative line of the Red Wing Thorobred motors. The model A is a 14-20 h.p. four-cylinder motor with bore and stroke of 3 1/2 x 4 1/2 inches. The cylinders are cast in pairs with gray iron crankcase and the motor is equipped with Dixie magneto model R Schebler carbureter and built-in Paragon reverse gear. The model AA is an 18-20 h.p. machine having 3 1/2 x 4 1/2-inch cylinders but resembling the model A in design and equipment. The model F motor, with 4 1/2 x 6 1/2-inch cylinders is a block type machine with detachable cylinder head. A feature of its equipment is the Leece-Neville two-unit 12-volt



Type of Consolidated cruiser powered with heavy-duty Speedway





The new overhead dual-valve Sterling for high-speed installations

electric starting outfit. The fourth motor on display is a model B, also of the block, detachable head type, with  $4\frac{1}{2} \times 5$ -inch cylinders, rated a 32-40 h.p. The detachable head of the models B and F is an interesting improvement which makes the cylinders more accessible and facilitates carbon removal.

...

The Luders Marine Const. Co., of Stamford, Conn., is showing an attractive 30-footer of the concave V-bottom type which has just been completed for the Palace exhibition. The boat is arranged with a forecabin forward with conveniences for the crew, a large watertight cockpit for the guests, an engine compartment in which are installed two of the new dual-valve Sterling engines, a cabin abaft the engine-room, and a large cockpit at the stern of the vessel. Features of the construction are the disappearing glass windshield and sliding awning for the forward cockpit, and the electric charging set which is independent of the main motors. There is a toilet in conjunction with the after cabin. Shelter for half a dozen persons is provided in the cabin and additional guests may be accommodated in the cockpit in complete protection from the weather. To insure stiffness, the boat is double planked with mahogany and braced with about 120 pairs of frames. The trim of the craft is genuine India teak, one of the most difficult woods to procure at the present time. A speed of 35 m.p.h. is in charge of this craft. Mr. G. S. Cole is in charge of the Luders exhibit.

...

The Simms Magneto Co., of East Orange, N. J., offers a unique exhibit of a magneto mounted on a stand completely enclosed in a glass case, and operating under a steady spray from streams of water. The exhibit, of course, is designed to demonstrate the water-proof qualities of the magneto. Other magnetos on exhibition comprise the Simms types for motors of from one to eight cylinders of single- and double-spark construction. Mr. A. J. Poole represents the company at the Show.

...

The Smith-Meeker Mfg. Co., of New York City, is displaying a full line of the various types and sizes of the Edison storage battery for radio lighting and ignition both on pleasure and commercial vessels. Other electrical equipment on exhibit is the Matthews generating unit in the  $\frac{1}{3}$  K.W. and 1 K.W. types with both hand and full automatic control, and the hand-controlled direct-connected 5 and  $\frac{1}{2}$  K.W. generating sets manufactured by the Winton Engine Works, of Cleveland, O. Standard radio auxiliary control switchboards, various types of yacht switchboards, incandescent and arc searchlights, and a full line of marine fixtures complete the display. Mr. C. J. Meeker has charge of this exhibit in Booths 30 and 31.

...

The Kermath Mfg. Co., of Detroit, Mich., is exhibiting the following Kermath motors: A 40 h.p. four-cylinder, four-cycle unit power plant with electric starter and Bosch magneto; 20 h.p. and 16 h.p. unit power plants with similar equipment; a 12 h.p. outfit with electric

starter and Atwater-Kent ignition, and a 20 h.p. engine mounted in a complete unit with a 6-inch centrifugal salvage pump. The last is of the same type that was furnished to the U. S. Navy during the war for general ship salvage and pumping work.

...

The Fay & Bowen Engine Co., of Geneva, N. Y., is exhibiting two models of boats and eight different motors in its space at the Palace. The larger of the boats is a 30-foot raised-deck runabout built with sufficient freeboard forward to make the cockpit particularly dry. The forward sections are designed to maintain a low bow wave even when running at full speed. It has a beam of 5 feet 6 inches, and draft of 23 inches, and when powered with a Fay & Bowen model L-63, six-cylinder motor, develops a speed of 20 m.p.h. The boat is handsomely built and is furnished with complete equipment.

The other boat on display is the 24-foot Junior runabout, a smart, snappy little craft of modern design and equipment throughout. It is built with the raised sheer embodied in so many boats of the latest design which is particularly effective in small boats because it increases the freeboard where it is most needed. Purchasers of this runabout may specify either a model L-40 or an L-41 four-cylinder Fay & Bowen motor.

Two of the motors shown—the L-N-42 and the TG-45—are new. The former is a four-cylinder medium-duty type with  $4\frac{1}{2} \times 5\frac{1}{2}$ -inch bore and stroke which develops from 20 to 40 h.p. The motor is of the L type with the cylinders cast en bloc and with the valves fully enclosed. The reverse gear which is a unit with the motor is of the multiple plate type running in oil. The other new motor, the TG-45, is a  $6\frac{1}{2} \times 8$ -inch T-head heavy-duty machine with cylinders cast in pairs. Its weight is 3,800 pounds and its design is declared to be absolutely unique. It is calculated to run from 400 to 600 r.p.m., and is rated as a 55 h.p. engine at 550 revolutions, the actual power developed at that speed being somewhat in excess of 55 h.p. Mr. W. L. Fay is taking charge of the exhibit.

...

The National Life Preserver Co., of New York City, is displaying its Ever-Warm Safety-Suit on figures in five sizes and is also having it demonstrated by young men and women. In addition there are exhibits of records of government tests, and the illustrated proof of lives saved in sea disasters by this life-preserving garment. The safety-suit is made in union style with shoes and mittens. It is all in one piece, completely enclosing the body excepting the head in a water-tight suit of a special quality of composition kapok silk floss which has five times the buoyancy of cork. The head is protected by a water-proof cap. Lead soles placed in the shoes keeps the wearer always upright in the water. Mr. A. E. Puchrin is in charge of the exhibit.

...

The Robertson Lubricants Co., of Philadelphia, Pa., is distributing its "Guide to Efficient Lubrication" which lists practically all makes of marine motors and gives the proper grade of Robertson lubricants for every part and tells how frequently the filler cases should be filled and also how and how often to wash the cases and refill them. The one- and five-gallon cans are displayed. These cans are interesting in that they also give instructions for washing and filling crankcases. The spout on the one-gallon can is of the extension type, being about four inches long; on the five-gallon size the lip spout is used. Mr. M. H. Robinson is in charge.

...

The Carlyle Johnson Machine Co., of Manchester, Conn., is located in Block K on the main floor and is featuring its model F ball bearing marine reverse gear. These gears have hitherto been manufactured for motors

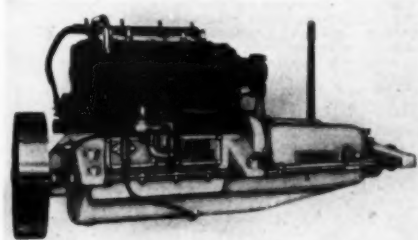
up to 50 h.p. at 1,000 r.p.m. but the exhibit includes a new and larger size known as the No. 5. The company is also displaying its 5 h.p. Bud E marine motor with new and up-to-date equipment including the BA2 Bosch magneto and the No. 6 Johnson ball-bearing gear closely bolted to the crankcase. In addition to the above there is a complete line of Johnson friction clutches in both the single and double type. The double type of this clutch is the basis of the company's reverse gears. They are also made in a one-way cut-off coupling type to connect the end of the engine shaft to the propeller shaft in small light-powered motor boats where a reverse is not desired.

...

The exhibit of the Hubbard H. Erickson Co., of Chicago, Ill., includes a complete line of large hardwood steering wheels, a new type of windlass, cast bronze running lights, galvanized seamless cowl ventilator, cabin light and fixtures, and a heavy type spark and throttle control. The Erickson 250-watt electric searchlight with cabin control is featured. Mr. H. H. Erickson is in charge of the exhibit.

...

One of the most interesting exhibits is that of the International Shipbuilding & Marine Engineering Corp., of Nyack, N. Y., which is showing in Space A4 on the main floor two of its latest cruisers. One of these is the International Thirty-Two, a cockpit model which sells at \$3,500 complete and is a seaworthy cruiser sleeping four, and having galley and toilet accommodations and cabin with full headroom. A Kermath motor with electric lighting and starting system drives the boat at 10 m.p.h. and furnishes electric lights throughout. The other boat is bridge-deck



Red Wing Thorobred, which is shown with detachable cylinder head

model of the same type which sells for \$4,000 ready to use. This cruiser accommodates six in two separate cabins between which there is a large bridge which can be enclosed. This boat also is Kermath powered. The exhibit is in charge of Mr. F. M. Hartman, vice-president and general manager, and he is assisted by the company's naval architect, Mr. Wm. J. Deed, and its superintendent, Mr. David Connor.

...

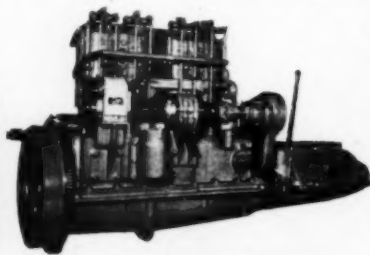
The entire output of the Evinrude Motor Co., of Milwaukee, Wis., during 1920 will be devoted to the single-cylinder Evinrude motor. Besides the motors of this type which are on display at the Show, the company is exhibiting a genuine Evinrude 16-foot round-bottom carved boat equipped with a 2 h.p. machine, and a 16-foot canoe powered with a 2 h.p. detachable Evinrude. The exhibit is in direct charge of Messrs. C. J. Meyer, president, Mr. Oluf Mikelsen, New York Branch manager, and Mr. O. A. Dole, sales manager of the Evinrude organization.

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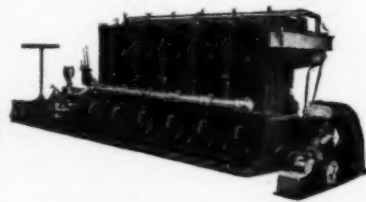
The A. C. Electrical Mfg. Co., of Dayton, O., has equipped its space with a stand displaying four types of dynamos from the 7-volt 5-ampere size to a 40-volt 20-ampere set, and five different models of switchboards for lighting and ignition systems. It is also displaying a full set of marine lamps, and has in operation a complete 12-volt lighting ignition



The 16-foot Evinrude canoe with 2 h.p. Evinrude motor



The 40 h.p. Knox valve-in-head motor with self-starter and integral reverse



Six-cylinder Wolverine motor equipped for the use of kerosene

system. There are in addition two of the company's latest models of direct-connected auxiliary lighting systems of 12 and 32 volts for general boat lighting, and a full line of governors and spring bases. Mr. R. H. Croninger is in charge of the exhibit.

**The Frisbie Motor Co.**, of Middletown, Conn., is exhibiting eight of its ten models of marine motors. They are as follows: A one-cylinder 5 h.p.; a one-cylinder 7 h.p.; a two-cylinder 10 h.p.; a two-cylinder 16 h.p.; a three-cylinder 25 h.p.; a four-cylinder 30 h.p.; a four-cylinder 40 h.p.; and a six-cylinder 75 h.p. On some of these motors will be found the Frisbie kerosene burning device which has enhanced the popularity of the Frisbie motor in localities where gasoline is readily available. A point of particular interest in the Frisbie exhibit is the new slow-down attachment. This is a device which by eccentric action on the rocker arm rods gives a smaller valve opening and allows the motor to be run very slowly to meet the requirements of the salmon troller. Another new point in the Frisbie line is the enclosed reverse gear which is furnished as optional equipment on the four- and six-cylinder motors with no extra cost. It is the regular Paragon reverse gear installed in an oil-tight case.

The exhibit of the **Cape Cod Shipbuilding Corp.**, of Wareham, Mass., comprises six models of Cape Cod dories, with and without power, ranging from 10 to 20 feet. Perhaps the most interesting of these is the 20-footer which is designed for rough waters, although, being of shallow draft, is well adapted for inland lakes. A 4 h.p. Palmer motor is installed in the extreme after end and is housed in with a little cabin fitted with a patented door arrangement. The motor is arranged to exhaust under water. This layout gives a lot of room in a small boat, the cockpit being about 8 feet long, free and clear of all machinery and having a comfortable seating capacity for ten persons. The bottom is well protected and the boat may be run up on the beach as it does not draw more than 6 inches of water forward.

**Fairbanks-Morse & Co.**, of New York City, are exhibiting two of their type C-O heavy-

duty marine oil engines. The smaller of these which develops 60 h.p. is a four-cylinder engine having an 8½x10-inch bore and stroke and turning at 400 r.p.m. It is equipped with reverse gear and weighs approximately 8,000 pounds. The other motor is a 200 h.p. direct reversible machine which develops its power at 250 r.p.m. Both are designed to operate on heavy fuels and a particular feature is that smooth and economical operation is secured without resorting to the injection of water into the cylinders. The C-O models are furnished with air compressors and an automatically operated air valve for each cylinder. The engines are started after the ignition tubes have been sufficiently heated by opening a gate valve in the compressed air line and through a mechanically operated distributor admitting the required amount of air to each cylinder.

**The Hall-Scott Motor Car Co., Inc.**, of Berkeley, Cal., is exhibiting two of its marine motors at the Show and in addition a 35-foot Hacker hull powered with one of these high-speed engines. The Hall-Scott is built in two sizes only—a four-cylinder 125 h.p. and a six-cylinder 200 h.p.—and it embodies many new features. Overhead valves operated by rocker arms and overhead camshaft are used and the valves are of large diameter and of high tungsten steel so cooled as to eliminate distortion and warping. The crankcase and the pistons are of a high-grade aluminum alloy giving strength without excessive weight, and it is claimed for this motor that it develops more power per cubic inch of cylinder capacity than any other marine motor.

**The J. V. B. Engine Co.**, of Akron, O., is showing the new marine engine designed by Joseph Van Blerck together with separate parts of it and of the new reverse gear. This motor is a four-cylinder job built in two speed ranges, high-speed and medium-duty. The former develops 45-60 h.p. at 1,000-1,450 r.p.m., and the latter 28-30 h.p. at 600-900 r.p.m. The four cylinders, of 4¼x6-inch dimensions, are of the block type cast integrally with the crankcase and upper half of the flywheel housing and containing four sleeves securely pressed into position which form the cylinder

walls and support the main bearings. This arrangement provides a large water jacket space insuring high efficiency of the cooling system and permitting the removal of the sleeve forming the cylinder wall without removing the engine from the boat. The separable cylinder head contains the valves which are surrounded by ample water-cooling space. They can be ground with great ease and all carbon removed without taking the whole engine apart. The reverse gear which was designed especially for the J. V. B. engine is a distinctive feature of its equipment. The gear is of the sliding transmission type and is so mounted that the entire housing can be removed allowing easy access to the clutch. The jackshaft carrying the gear for the ahead and astern motion is supported by ball bearings which take care of the radial and thrust loads. The whole reverse gear is lubricated by pouring an amount of heavy cylinder oil into the case, and it seldom needs refilling. It has an absolutely neutral position.

**The Gray Motor Co.**, of Detroit, Mich., is showing a representative line of marine motors in Space G under direction of Mr. W. C. Disbrow. One of the most interesting and adaptable of the Gray four-cycle motors is the model VM four-cylinder valve-in-head. This motor, developing from 20 to 28 h.p. at 900-1,150 r.p.m., is suitable for a 20- to 30-foot V-bottom or round-bottom runabout, is compact and sufficiently light in weight for a small hydroplane, and yet possesses the power and endurance requisite for work in fish boats and for small cruisers. The cylinder head is so designed that the gas intake passages come under the exhaust passages, coming in contact with two hot spots. Heated air is drawn through the carburetor inlet, increasing the vaporization to such an extent that low-grade gasolines and even kerosene may be used satisfactorily. The valves, flywheel, and electric starter are enclosed, thus insuring quietness and cleanliness. In the two-cycle line the double-cylinder model U developing 8 h.p. at 800 r.p.m. is an old favorite. This motor is an exceptionally compact and light weight machine and is well adapted for pleasure and commercial craft of from 18 to 25 feet in length.

## Exhibitors at the 1920 Motor Boat Show

(Continued from page 37)

**National Life Preserver Co.**.....New York, N. Y.  
Space 73  
**Navy Gear Mfg. Corp.**.....Port Chester, N. Y.  
Space 12  
**New Jersey Motor Sales Co.**.....Keyport, N. J.  
Space A7  
**The N. Y. Yacht, Launch & Engine Co.**.....New York, N. Y.  
Space C  
**Niagara Motors Corp.**.....Buffalo, N. Y.  
Space G2  
**North East Electric Co.**.....Rochester, N. Y.  
Space 51  
**New Process Chemical Co.**.....New York, N. Y.  
Space 3  
**Palmer Bros. Engines, Inc.**.....Cos Cob, Conn.  
Space C  
**Paragon Gear Works.**.....Taunton, Mass.  
Space 20-21  
**Parr-Loichot Engine Corp.**.....New York, N. Y.  
Space G2  
**Peerless Marine Motor Co.**.....Buffalo, N. Y.  
Space G2  
**Petroleum Power Devices Corp.**.....New York, N. Y.  
Space 72  
**Red Bank Yacht Works.**.....Red Bank, N. J.  
Space B-4  
**Red Wing Motor Co.**.....Red Wing, Minn.  
Space C  
**Regal Gasoline Engine Co.**.....Coldwater, Mich.  
Space C  
**Robertson Lubricants Co.**.....Philadelphia, Pa.  
Space 42  
**Rochester Boat Works.**.....Rochester, N. Y.  
Space 38  
**Scripps Motor Co.**.....Detroit, Mich.  
Space G1  
**Simms Magneto Co.**.....E. Orange, N. J.  
Space 83-85  
**Sinclair Refining Co.**.....Chicago, Ill.  
Space 27  
**The C. C. Smith Boat & Engine Co.**.....Algonac, Mich.  
Space H

**Edw. Smith & Co.**.....Long Island City, N. Y.  
Space 22-23  
**Smith-Meeker Engineering Co.**.....New York, N. Y.  
Space 30-31  
**The Snow & Petrelli Mfg. Co.**.....New Haven, Conn.  
Space 67-69  
**Sperry Gyroscope Co.**.....Brooklyn, N. Y.  
Space 91  
**Sterling Engine Co.**.....Buffalo, N. Y.  
Space E  
**Stromberg Motor Devices Co.**.....Chicago, Ill.  
Space 66  
**Topping Bros.**.....New York, N. Y.  
Space 46  
**W. & J. Tiebout.**.....New York, N. Y.  
Space 18-19  
**Toppan Boat Mfg. Co.**.....Medford, Mass.  
Space B4  
**Triplex Safety Glass Corp of America.**.....New York, N. Y.  
Space 4  
**The Therox Co.**.....Woolworth Bldg., New York  
Space 11  
**Valentine & Co.**.....New York, N. Y.  
Space 47-49  
**Van Blerck Motor Co.**.....Monroe, Mich.  
Space F 1-2  
**Verrier, Eddy Co.**.....New York, N. Y.  
Space C  
**The Wheeler-Schebler Carburetor Co.**.....Indianapolis, Ind.  
Space 56  
**E. J. Willis Co.**.....New York, N. Y.  
Space 87-89  
**Wireless Specialty Apparatus Co.**.....Boston, Mass.  
Space 71  
**Wisconsin Motor Mfg. Co.**.....Milwaukee, Wis.  
Space B7  
**Wolverine Motor Works.**.....Bridgeport, Conn.  
Space L  
**C. A. Wollsey Paint & Color Co.**.....Jersey City, N. J.  
Space 16  
**R. W. Zundel Co., Inc.**.....New York, N. Y.  
Space 74-76

# Hints on Keeping the Motor in Shape

## No. 4—The Wisconsin Engine

**E**ACH motor has its own idiosyncrasies and consequently when we attempt to instruct the motor boat owner who looks after his own motive power in the proper method of taking care of his engine, each make requires specific instructions and specific treatment. The Wisconsin Consistent motor, manufactured by the Wisconsin Motor Mfg. Co., of Milwaukee, Wis., has features that are entirely distinctive from those of other engines, and in order to keep the Wisconsin motor in proper shape, the following instructions should be carefully studied:

Exhaust pipes should be as large as possible, in no case smaller than the size of exhaust manifold, and all piping should be as free from short bends and elbows as possible.

The intake water piping should be as short and straight as possible, the usual location of the intake being in the bottom of the boat. The opening should be protected by a water scoop which should be installed with the opening forward. It is also advisable to have a shut off valve at the water inlet which can be closed if it is necessary to disconnect the water piping for any reason. If rubber hose is used in the water inlet connections, care should be taken to prevent the collapsing of the hose, either by using a heavy hose or inserting a brass wire coil inside of the hose, otherwise the engine will not receive sufficient cooling water.

The water outlet piping should be connected to the water outlet opening on the exhaust manifold and carried out through the side of the boat just above the waterline. It is then an easy matter to see if the water is circulating at any time. Outlet piping should be amply large to allow free passage of water, otherwise steam will form in the engine. Part of the water may be directed into the exhaust pipe by a branch pipe at a point lower than the exhaust manifold so that there will be no danger of the water getting back into the cylinders. This water connection will keep the water pipe cool and also reduce the noise of the exhaust. A regulating valve should be installed in the branch pipe between the main outlet water pipe and the exhaust pipe so that the amount of the water to the exhaust can be regulated.

A small vent hole, about  $1/32$  to  $1/16$  of an inch in diameter, must be drilled into the filler cap of the gasoline tank to allow air to enter and replace the gasoline as it is consumed, otherwise the free flow to the engine will cease. If it is not possible to locate the tank so that the lowest part of it will be at least six inches above the carbureter, it will be necessary to use air pressure to force the gasoline up to the engine. In the case of pressure systems the vent hole in the filler cap must, of course, be closed.

A strainer should be provided in all gasoline tanks at the point where the pipe connects to prevent dirt getting into the carbureter and causing trouble.

Gasoline piping should be of copper or brass with at least a  $5/16$ -inch clear inside diameter for engines up to 50 h.p., and  $1/2$ -inch for larger sizes. A shut off valve should be installed at the gasoline tank and another at the carbureter. A gradual drop in the gasoline pipe from the

tank to the carbureter without pockets or short bends is very much to be preferred. Use shellac or common laundry soap on all gasoline pipe connections.

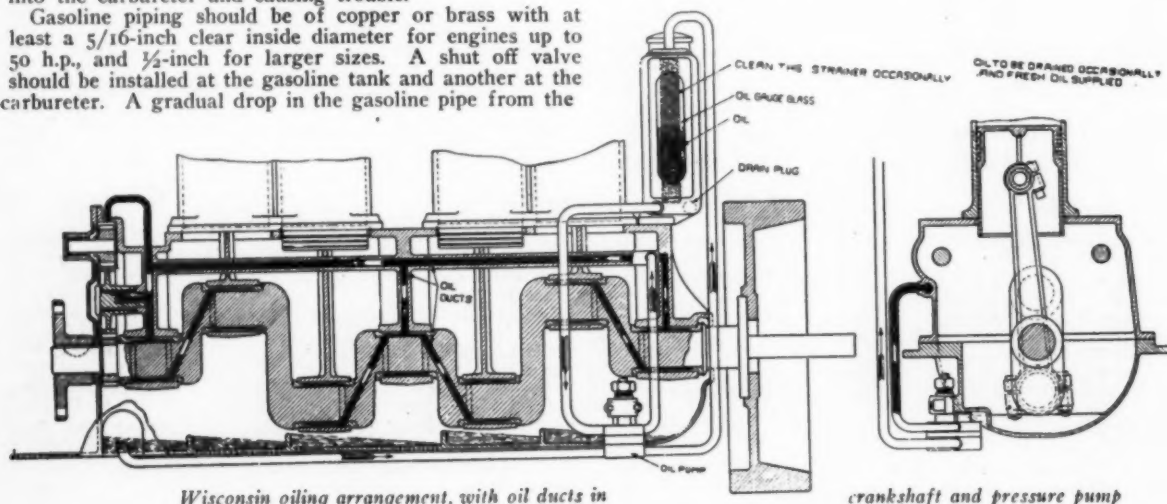
The oiling system on Wisconsin engines is of the combined pressure and splash type, and is the result of years of experience. The oil reservoir is carried at the forward end of the engine near the flywheel, except in the case of the small type QM  $3\frac{1}{4} \times 5$ -inch engine where it is built into the lower crankcase at the reverse gear end of the engine. This oiling system is designed to operate with the engine on an angle with the flywheel at the higher level, unless specially ordered otherwise. The oiling system will not operate if the flywheel end of the motor is lower than the gear end. The reason for this will be apparent from the following description.

Before starting up a new motor the oil reservoir should be filled with a good automobile or gas engine oil of heavy grade.

The oil pump on the engine has two sections, the upper or narrower section takes the oil from the reservoir and forces it to the main duct cast integral with the crankcase from where it is distributed to the main and connecting-rod bearings and also the camshaft gears. The oil is forced out through the bearings and is thrown off from the crankshaft, forming a spray which lubricates the cylinders, wrist pins, cams, etc. The excess oil drains down into the bottom of the case and is carried in several troughs under the connecting rods. The rods dip slightly into these troughs, forming an additional splash for lubricating the internal parts of the motor.

And oil strainer is provided in the oil reservoir. It sometimes happens that after the motor has been stopped for some time all of the oil will seep down through the pump into the engine. This will do no harm as after the engine is started the oil will be returned to the reservoir in a few minutes. Therefore no more oil should be added until after the engine has been run two or three minutes and all of the oil has been returned to the reservoir, as can be seen by the oil gauge. If the oil does not return to the reservoir it is an indication that some foreign substance has clogged some one of the oil pipes. The oil pipes must then be removed, cleaned and carefully replaced. A pet cock is provided on the main oil duct for the purpose of testing the oil circulation at any time.

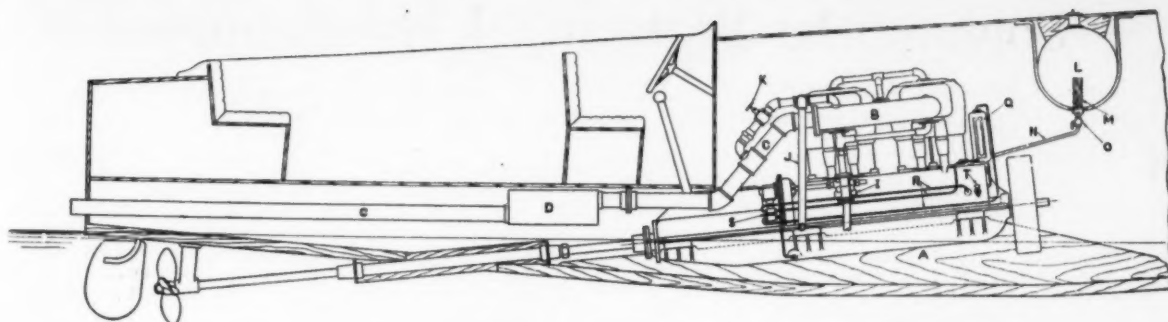
Any oil will wear out after being used continuously and it will be well to drain all oil out of the reservoir a few times a season and replace with fresh. Also take off the inspection plates on the side of the crankcase and wipe out all of the old oil and wash out with kerosene. Always use



Wisconsin oiling arrangement, with oil ducts in

crankshaft and pressure pump





rags for this purpose. Never use waste, as particles will remain in the crankcase and clog the oil lines.

Wisconsin engines are regularly built to turn left hand when facing the flywheel and fire their cylinders in the following order, cylinder No. 1 being nearest to the gear end opposite the flywheel.

Four-cylinder firing order 1 3 4 2.

Six-cylinder firing order 1 4 2 6 3 5.

Eight-cylinder firing order 1 5 3 7 4 8 2 6.

Right-hand engines fire in the following order:

Four-cylinder firing order 1 2 4 3.

Six-cylinder firing order 1 5 3 6 2 4.

Eight-cylinder firing order 1 6 2 8 4 7 3 5.

Magnetos are mounted and properly timed at the factory before engines are tested, but if for any reason it is necessary to retune a magneto, proceed as follows: Open the priming cups on the cylinders and turn the engine over by hand, holding a finger on top of the priming cup on No. 1 cylinder, which is the one nearest the gear end, until compression blows through priming cup under the finger. This indicates that No. 1 piston is coming up on compression stroke. Keep on turning crankshaft until the piston is near the top of the stroke. Then to get the piston exactly on the upper dead center turn the flywheel so that the line marked Dead Center 1 and 4 coincides exactly with the indicating pointer put on the engine for that purpose. Now retard the spark advance lever on the magneto to extreme position. The retarded position is in the same direction as that in which the armature of the magneto rotates. Then turn the magneto shaft so that the breaker on the magneto is just on the point of opening, bolt magneto coupling in this position.

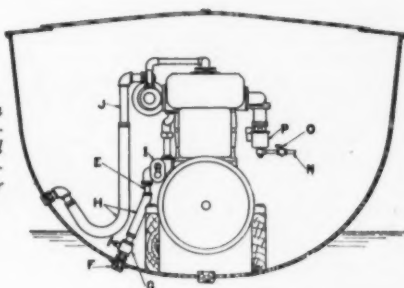
The wires leading to the spark plugs must now be connected. Locate the terminal on the magneto on which the distributor brush is resting and connect this with the spark plug in No. 1 cylinder. The other terminals taken consecutively in the direction in which the distributor brush rotates must then be connected to the other cylinders in the order in which the cylinders fire.

Valves will occasionally need regrinding as their seats become dirty and leaky from carbon particles. To do this unscrew the covers over the valves and remove the springs by raising the valve spring seats and withdrawing the valve seat locks. Take out the valve, coat the bevel seat with oil and sprinkle with fine emery or valve grinding compound. Reinsert the valve and with a brace or screw driver inserted in the slot in the head of the valve rotate it back and forth about one-half turn ten or twelve times. Take the valve out and examine the seat in the cylinder. If the seat shows up even all around wash it off clean with gasoline and replace the valve and spring. If the seat is not even, repeat the grinding operation until the seat is perfect. Do not grind too much at one time. If a sharp corner or shoulder appears on the valve or valve seat this should be removed with a file or scraper.

The valve tappet screws will most likely require adjusting after grinding valves. These should be adjusted to three or four thousandths of an inch clearance on the inlet valves, and four or five thousandths on the exhaust side. If adjusted closer than this the valves will not seat tight. Ordinary writing paper is about three thousandths thick. The lock nut on the valve tappet adjusting screw must be screwed down tight on the tappet after adjusting so the screw will remain in proper position.

Crankshaft and connecting-rod bearings will also require adjusting after they have worn. A loose bearing will make itself known by a slight pound at every revolution. To take up this looseness the bearing cap must be removed and

Installation  
sections rec-  
ommended  
by the Wis-  
consin Motor  
Mfg. Co.



one or more of the thin metal shims taken out and the cap replaced. Great care must be exercised so the bearing will not be adjusted too tight. The bearings must be perfectly free when the bolts on the cap are drawn up tight. If it is necessary to put in a new bearing this must be carefully scraped by an experienced man to a good fit. The sides of a bearing should be relieved with a scraper for a distance of about  $\frac{3}{8}$ -inch from the edge of the shell, and oil grooves must be cut. The oil holes drilled in the crankshaft should also be examined to see that they are perfectly clear, and the oil grooves in the bearings must line up with these oil holes. After a new bearing has been fitted the engine should be run lightly for the first few days, so the bearings will be properly worked in.

Reverse gears should be filled with heavy cylinder oil or grease through the screw plug in the head of the gear. Very little oil is required in the gear housing to lubricate the shifting collar and reverse band. If the clutch slips this may be stopped by tightening up slightly on the clutch adjusting collar. If the reverse band wears so it will not reverse properly tighten the nut on the band. Both of these adjustments should be made carefully, as if set up too tight the shifting mechanism will be strained unduly and the clutch or band will drag when in neutral.

In starting the engine open all sea cocks in the water piping; set the reverse gear in neutral; open the gasoline valves; flush the carburetor and if fitted with a mixture regulator set to rich position; retard spark lever to extreme position and open throttle about one-quarter; turn switch on battery; engage starting crank and crank over briskly; when the engine starts turn the switch to the magneto and advance the spark lever, set the throttle lever so the engine turns over slowly, and if the carburetor is fitted with mixture regulator this should be moved toward lean position as engine warms up; make sure water and oil are circulating; try test cock on oil line unless an oil pressure gauge is installed; engage clutch or reverse gear gently, first speeding up engine a little with throttle lever, so there will be no danger of stalling.

When laying up the engine for any length of time all water should be drained out of cylinders, pump and piping. All steel parts should be coated with grease or heavy oil to prevent rusting. It is also well to pour about one-half cup of cylinder oil into each cylinder, through a spark plug opening and turn the engine over slowly half a dozen times to coat the cylinder walls well to prevent rusting over winter. When starting up again the oil or grease should be washed off with kerosene or gasoline and a small quantity of kerosene should also be poured into the cylinders and the engine turned over by hand to soften up the old oil in the cylinders. All old oil should be drained out of the engine and fresh oil filled into the oil reservoir.

# Solving the Problem of Handicapping

Valuable Suggestions and Formulas for Making Time Allowances Specified by the American Power-Boat Association Rules More Equitable

IN every club using the A.P.B.A. system of measuring and handicapping it develops that many boats do not perform consistently, some developing speed in excess of what the rating would indicate, and others falling below the expected speed. It is not just that such boats should be barred from entering their club races because under the A.P.B.A. system they cannot possibly win. Race committees are compelled to use some other system to equalize the chances of each boat in the race, and the one generally resorted to is the system of handicapping by previous performance. This presupposes some opportunity for the committee to determine the actual speed of the craft through the water, and where a series of race records are carefully kept a rather close calculation can be made. In the event of a new boat entering the race without having before contested, it is necessary to determine her speed in some manner other than by actual race records, and in this case she is usually run over a known course or distance, and her time in slack water calculated therefrom. Here is where the difficulty occurs, as when she comes to compete in the actual race with boats that are entered in the event under their performance in actual races, with the varying tidal conditions that have effected them, it will be found that should the conditions be favorable as to tide the new craft will run away with the race, and if the tidal conditions are unfavorable, the new craft will then have no chance whatever.

To overcome as much as possible this inequality, the writer has used a system which in actual practice has proved satisfactory. He bases all his calculations upon the actual rating of the boat obtained by A.P.B.A. measurements, together with the actual speed the craft will show in as many races as he can secure records of, in which she performed, or else the records of as many trials of the boat as he can have made under varying conditions of tides.

With this as a basis he has a formula by which ratings based upon a combination of the two can be assigned, and then the allowances as provided in the regular A.P.B.A. Tables of Allowances made according to the distance of the race to be held.

The formula is simply a working out of the percentage of the boat's known speed as compared with what he considers is "100 per cent. efficiency" according to the rating she has through measurement under A.P.B.A. rules. He has kept records of some two hundred different craft that have raced in events during the last few years, and has calculated in each case the percentage the speed actually developed bears to the rating of the boat divided by the constant 4.167.

The A.P.B.A. Table of Allowances is based upon the supposition that a perfect combination of designed hull and motor power should develop a speed equal to the rating of the boat divided by 4.167. It is admitted, however, that scarcely any craft will equal this in speed, and records show that the speed efficiency of cruising boats will run from 85 per cent. to 95 per cent. when calculated under this rule. Occasionally a boat will bob up in races which will surprise everyone by the speed developed under the rating assigned to her, and most of us are apt to be skeptical as to whether some mistake has been made in the rating. With that question I do not intend to have any discussion in this article, but will try to outline how I would go about equalizing by handicap such a boat with another whose speed efficiency showed below normal, or 90 per cent. of what her rating divided by 4.167 would indicate she should do under ordinary conditions.

As an illustration let us take two boats that have competed in prominent events this past season, one of which shows phenomenal speed according to her rating, and the other shows less speed than her rating indicates she should develop. We will call them Boat No. 1 and Boat No. 2, as should I name the craft the respective owners might object to the publicity.

Boat No. 1 in two long-distance races shows by my records as follows:

No. 1—Rating 35.00; expected 100 per cent. speed by dividing 35.00 by 4.167 we find to be 8.40 knots.

In the two races of which the record was kept this craft actually developed a speed of 8.30 knots in one race and of 8.52 knots in the other race, making an average actual speed of 8.42 knots.

This actual speed as compared with the expected speed according to the rating she has is 100.2 per cent.

As it has been found that the average craft used for cruising purposes only shows an actual speed of about 90 per cent. then this particular craft is 10.24 per cent. above the average craft.

Boat No. 2, which I have taken as the second example, has an A.P.B.A. rating of 34.77. This rating divided by 4.167 give us a theoretical speed for a perfect performance of 8.32 knots.

Records carefully kept of four races in which this craft participated show actual performance as follows:

In long-distance race in which she competed against Boat No. 1 she developed a speed of 7.40 knots. In three other races her actual speed was 6.98 knots, 7.24 knots and 6.92 knots. Calculated from these four events she developed an average speed of 7.13 knots. This average speed as compared with the theoretical speed as shown by her rating shows a percentage of only 85.69 per cent. This is 4.31 per cent lower than the average as shown by a large number of records.

The question that confronts the Race Committee is how to equalize the chances of winning should these two boats meet in a race under performance rules. To continue racing under the A.P.B.A. rating, which each boat has, is confessedly impossible, hence the performance rating must be adjusted in each case to bring the two boats upon an equitable basis for racing, so that the A.P.B.A. Table of Allowances can be applied.

Based, as before stated, upon the assumption that the Table of Allowances is so adjusted that any rating divided by the constant 4.167 gives the theoretical speed which a perfect boat should develop, and upon the further fact that records of a large number of boats of various types and powers has shown that the average of actual speed to the theoretical speed is only about 90 per cent, it is evident that to so adjust the ratings of each boat so that its actual speed will be about 90 per cent. of the theoretical speed of a rating which will be just, is the only practical method.

To accomplish this I have been using the following formula: Let MR represent the A.P.B.A. measurement rating.

Let TS represent the theoretical speed which a perfect boat of that rating should develop.

Let AS represent the actual speed which the records show the boat in question has developed in races, trials, and other events where the speed can be accurately figured over known distances.

Let PR represent the performance rating which the boat should have in order to equitably apply A.P.B.A. Tables of Allowances.

The factors MR, TS, and AS are known quantities, and from these we get the formula to find the unknown quantity PR as follows:

$$MR \times (10/9th \times AS) \div TS = PR.$$

Applying this formula to Boat No. 1 we have the following:  $35.00 \times (10/9th \times 8.42) \div 8.40 = 38.98$ , which gives the rating for performance handicapping under which allowances should be made in the usual manner from the A.P.B.A. Tables of Allowances.

Applying the formula to Boat No. 2 we have the following:  $34.77 \times (10/9th \times 7.13) \div 8.32 = 33.06$ , which is the rating this boat should be handicapped under for performance events.

I have previously mentioned that both of these boats competed against each other in a long-distance, sanctioned race held this past season. Eleven other craft competed in the same race, but the actual performance of these two craft showed that No. 1 was the fastest in the event, and No. 2 was about the slowest in actual speed. The two extremes will be sufficient to show the working of the formula and method of handicapping. The distance was 45 nautical miles.

According to the A.P.B.A. ratings and allowances under which this race was conducted the allowance between Boat No. 1 and Boat No. 2 and the elapsed and corrected times were as follows:

Boat No. 1—Rating 35.00. Allowance (none). Elapsed time, 5h.-16m.-4s. Corrected time, 5h.-16m.-4s.

Boat No. 2—Rating 34.77. Allowance 1m.-52s. Elapsed time, 6h.-3m.-59s. Corrected time, 6h.-2m.-7s.

(Difference on corrected time of 46m.-3s.)

Had this race been run under the performance rating each boat gets by applying the formula, the results would have been as follows:

Boat No. 1—Rating 38.98. Allowance (none). Elapsed time, 5h.-16m.-4s. Corrected time, 5h.-16m.-4s.

Boat No. 2—Rating 36.06. Allowance, 51m.-26s. Elapsed time, 6h.-3m.-59s. Corrected time, 5h.-12m.-33s.

(Difference on corrected time of only 3m.-31s.)

When it is considered that these two craft were the extremes of speed in the class in which they raced and that eleven other boats competed, most of them finishing between these two extreme boats, it will readily be seen how closely the performance rating as secured by the formula would have bunched them on corrected time.

The writer appreciates that in events open to boats of all

(Continued on page 204)

# New Things for Motor Boatmen

Each month new parts, attachments, and fittings, interesting and invaluable to owners of large and small motor boats, are added to the devices already on the market. Announcements of these articles come to us in such numbers that in order to introduce all of them to our readers we have been obliged to omit descrip-

tions and publish only illustrations with short explanatory captions. In doing this, however, we urgently invite our readers to write us for complete information, as we shall take the greatest pleasure in providing it, together with the name and address of the manufacturers from whom the products may be obtained.



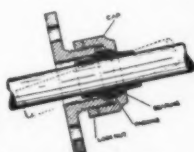
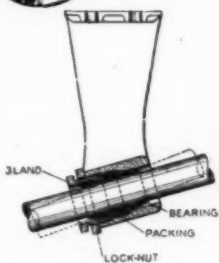
This fire extinguisher has been particularly developed for the motor boatman. It will quickly put out a fire of gasoline or electrical origin



A pump which works while you sleep. This bilge pump is actuated by the motion of the boat and will keep it dry for you without any effort on your part



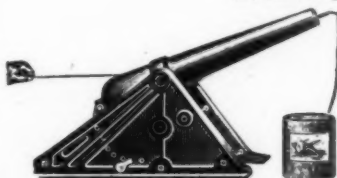
Here is a wrench whose manufacturer says to his dealers: "If a customer returns one of these wrenches that proves unsatisfactory — don't argue — hand over a new wrench, we'll make good"



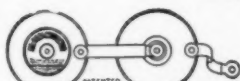
A patented strut and stuffing box which can be applied to any boat. These contain a universal bearing which takes care of the shaft alignment



A hack-saw frame with a new handle that is easy, comfortable and natural to hold



A requirement on all passenger carrying vessels is a line-throwing gun. The one here shown has been especially gotten up for this purpose



An innovation in dry battery service is this battery with the connectors permanently attached in place on the zinc terminal



Especially suitable for yachts and motor boat windows is this unit sash balance. A spring controlled noiseless device perfectly balancing the window and made entirely of brass



An air planer that is adapted to hard, fast work in the wooden shipyard. One man with one of these can do more and better work than numerous men with the old hand tool



A screw-driver of fine appearance which can be used as a pinch bar should the occasion arise



How much gasoline do you use? Here are some tablets to put in your tank which are said to give anything from twenty to fifty per cent. more mileage and to eliminate carbonizing

Do not fail to write to the editor if you desire information concerning any of the above new things



# TRAP

for Motor



# SHOOTING

Boatmen

Conducted by Wm. M. Eldridge

## East vs. West at Pinehurst

WHILE the main feature prepared for the annual Mid-Winter Handicap Tournament at Pinehurst, N. C., for the last twelve years has always been the mid-winter Handicap itself, greater interest appears to be taken in the more recent feature, the East vs. West Team Race.

This race is decided by the scores made on all registered

January 23rd. From the first to the last target it was anybody's victory and only those who attended or who have been to a large shoot can realize the thrill and excitement this shoot brought. Nineteen-twenty for the Eastern team against 1908 for the Westerners was the final score. Each man shot at 400 targets, or 2,000 to the team. When you stop to consider that only two targets difference in 2,000 was the

result of the team race you will realize just how close this event ran. It is hardly fair to say that any one man won the race, as every competitor shot in perfect form. However, Dr. A. H. Aber of Dravosburg, Pa., broke the last fifty straight and nosed out the national amateur champion, Frank S. Wright, of Buffalo, N. Y., one of his teammates, by a single target for high average of the tournament. The team scores were: THE EAST:—Dr. A. H. Aber, 384; Frank S. Wright, 383; C. D.



Winchester sportsmen's headquarters to which all motor boatmen are invited

targets on the program, the totals counted being the five highest made by shooters from the East and by the five highest from the Western portion of the United States. The 1920 race commenced January 20th and ended



Okoboji Indians trap shooting at Lake Harbor, Mich.



Sun Ship Gun Club

Coburn, 382; Paul R. Earle, 381; J. Clark, Jr., 380. Total 1910. THE WEST:—Frank M. Troch, 383; Harvey Dixon, 383; Pete S. O'Brien, 382; William Wettleaf, 380; Claude Eaton, 380. Total 1908.

When the second day scores had been figured up it rather looked as though the Westerners had gathered a considerable jump on the Eastern competitors, for at this time it was found that the West was ahead five targets after 300 of the 400 had been shot at. On the third day 50 targets per man were shot at and the East finished only one behind at the end of the day. The last 50 targets were shot at on the fourth day and the East broke the excellent total of 241 to 238 for the West, winning by the close but comfortable



*F. S. Wright, of Buffalo, one of the country's crack trap shooters*

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leagues, just refer to what happened in the City of Brotherly Love on Saturday, January 25. No worse day for the sport could have been chosen, heavy rain and sleet, a driving E. N.E. wind with an ice sheeting covering everything exposed to the weather, including the shooters themselves. Only the real dyed-in-the-wool supporters of their respective clubs would have turned out in such weather.

*Tom Davis Extends Invitation to Visitors at the Motor Boat Show*

The Winchester Arms Co., through Tom Davis, extends to all visitors to the Motor Boat Show an invitation to make themselves at home at Sportsmen's Headquarters, at Fortieth Street and Fifth Avenue. Mr. Davis will be glad to meet his old friends and all those interested not only in trap shooting or motor boating, but all who are interested in the great outdoors.

*Lincoln's Birthday and Washington's Birthday Shoots*

Yacht clubs around New York which will hold large shoots on both holidays will be New Rochelle Club, Larchmont Yacht Club, Jersey City Gun Club, New York A. C. and the Bergen Beach Yacht Club. Entries indicate that each of these clubs will have an enormous attendance.

margin of two targets. This was without question one of the best and most spectacular tournaments ever conducted.

*Crowds Attending League Shoots Show an Ever-Increasing Interest*

The time is not far distant when leagues throughout the country composed of yacht clubs will hold tournaments such as the one just held by the Philadelphia Trap Shooters League. If there is any doubt as to the possibility of such



*A regular trap shooting tournament on the Chesapeake*  
Copyright Underwood & Underwood



*Grand American Handicap Date Selected*

The American Trap Shooting Association announces that its twentieth annual Grand American Handicap Tournament at Targets will be held at Cleveland, Ohio, Monday to Friday, August 23 to 28. This is the star event of the year and will without question bring together the greatest and largest number of trap shooters ever entered in one event.

*January Trap Shooting Section Brings Inquiries from Many Clubs*

It is indeed gratifying to learn that a number of yacht clubs never before realizing the importance of trap shooting for their welfare have taken up with us the matter of installing traps. Yachtsmen generally and trap shooters particularly will be glad to know that one of New York's prominent yacht clubs, the New York Motor Boat Club, is considering the installation of traps.

# Yard and Shop

Notes of Interest to Both Owner and Manufacturer

## Mianus Heavy-Oil Demonstrator

Not long ago there passed through New York Harbor a heavily built motor boat equipped with one of the new 30 h. p. Mianus heavy-oil engines. This craft is journeying from Maine, where it was built, to Florida. The center of attraction at each stopping place is of course the engine. Capt. Smith, in charge of the boat, is well versed in the principles of operation of the engine and is only too glad to explain its strong points. Turning a 34 x 34-inch Hyde propeller at 360 r.p.m. is a simple matter for this engine. Whether the clutch is in or out the heavy flywheel and governor controls the speed perfectly and the simplicity of the machine is remarkable. Fuel is injected by a small pump into each cylinder and is fired and burned by the heat of compression in true Diesel fashion. A patented spray nozzle at the injection point looks after the slow continuous expansion of the charge and the power is developed continuously throughout the stroke without the violent shock of the gasoline explosion.

As long as there is fuel in the tank an engine of this kind will continue to run, as there is nothing to get out of order or adjustment. All parts are heavy and very substantially made and an engine of this type should last a lifetime.

Compare the fuel economy of one of these heavy-oil engines with the similar size gasoline engines. Two gallons of heavy oil at eight cents per gallon will furnish power at a cost for fuel of about one-half cent per horsepower hour. Seven gallons of gasoline at twenty-eight cents in a 37 h.p. gasoline engine will cost five and three-tenths cents per horsepower hour, or almost exactly ten times as much. Any one can figure out for himself in how many hours of operation this engine will save its cost.

## An Old Firm with a New Name

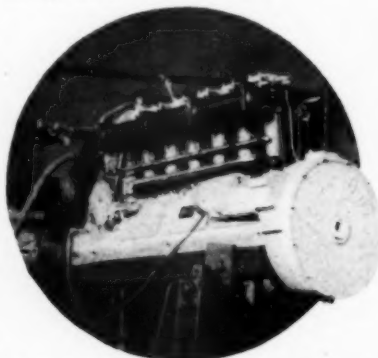
The Cape Cod Shipbuilding Corporation has taken over the old firm of Cape Cod Power Dory Co., and will operate the factory and its equipment in a modern way. A site has been secured where a modern yard will be built. Boats up to a length of 150 feet will be well within the capacity of this plant. The management of the company will remain in the hands of C. S. Gurney, as president, and William Minot as treasurer.

## Jordan Bros. Lumber

Jordan Bros. Lumber Co., of Norfolk, Va., manufacturers of White Cedar boat boards and cedar products, have successfully completed their work for the Government and are now prepared to take care of their commercial business.

## Arthur Utz Joins Hall-Scott Forces

The exhibit of motors by Hall-Scott Co., at the National Motor Boat Show, will be in charge of Arthur Utz and John J. Robinson. Mr. Utz was formerly sales manager of the Sterling Engine Co., Brooklyn, N. Y., and has joined the staff of the Hall-Scott Motor Car Co. of Berkeley, Cal. He will have charge of the eastern sales and service office to be opened in Buffalo, N. Y.



A Hall-Scott marine motor on the testing block coupled directly to the Sprague Dynamometer, which records the characteristics of its performance

It will be equipped to look after the interests of all Hall-Scott customers in the East.

To silence statements that have been made, that Hall-Scott motors are only rebuilt aeroplane motors, it is the intention of the Hall-Scott company to exhibit one of their aeroplane motors so that every one may see the fallacy of such statements.

## Stanley Wood Returns

After having served in France with the A. E. F., Stanley Wood has returned to G. B. Carpenter & Co., of Chicago, Ill., and will assume charge of the Marine Hardware Department of this firm.

## Kermath Motor Always Runs

A letter received by the Kermath Manufacturing Company from a correspondent in Florida is interesting. It reads in part as follows: "How the devil does one stop the engine you sold me? I haven't found no way yet to wire the switch that will stop the current to the plugs. Let me know how at once." The general trouble with motors is not that they will not stop, but that they will not start. The Kermath doesn't seem to be troubled in this direction.

A new motor of 40 h.p. made by the Kermath Manufacturing Company is about ready to be put on the market. This engine may be successfully operated at speeds as low as 500 r.p.m., and on the other extreme is capable of speeds up to 1,200 r.p.m. No expense is being spared to make this engine perfect, and it is equipped with the best accessories that it is possible to buy.

## Boston to Have a Motor Boat Show for the First Time in Seven Years

Boston is to have a motor boat show. It will be held during the week of March 27th to April 3rd, under the auspices of the New England Engine and Boat Association. It is obvious that the industry needs a show in New England to capture some of the business there. The show will be staged by Chester I. Campbell, who is enthusiastic over the possibilities in New England.

## Ingram Triple Seal Rings

Among the many new designs of perfect seal rings we find the two-piece ring of the Ingram Motor Co. These are two-piece rings which are inserted in the piston grooves as one piece rings and are securely sealed at three points and locked by a lip, thus preventing either of the rings oscillating over the other and opening the joints. When cylinders wear large in the course of time, it is not necessary to re-grind the cylinders on account of the perfect contact of these rings on the cylinder walls.

## J. V. B. Engines Going to Sweden

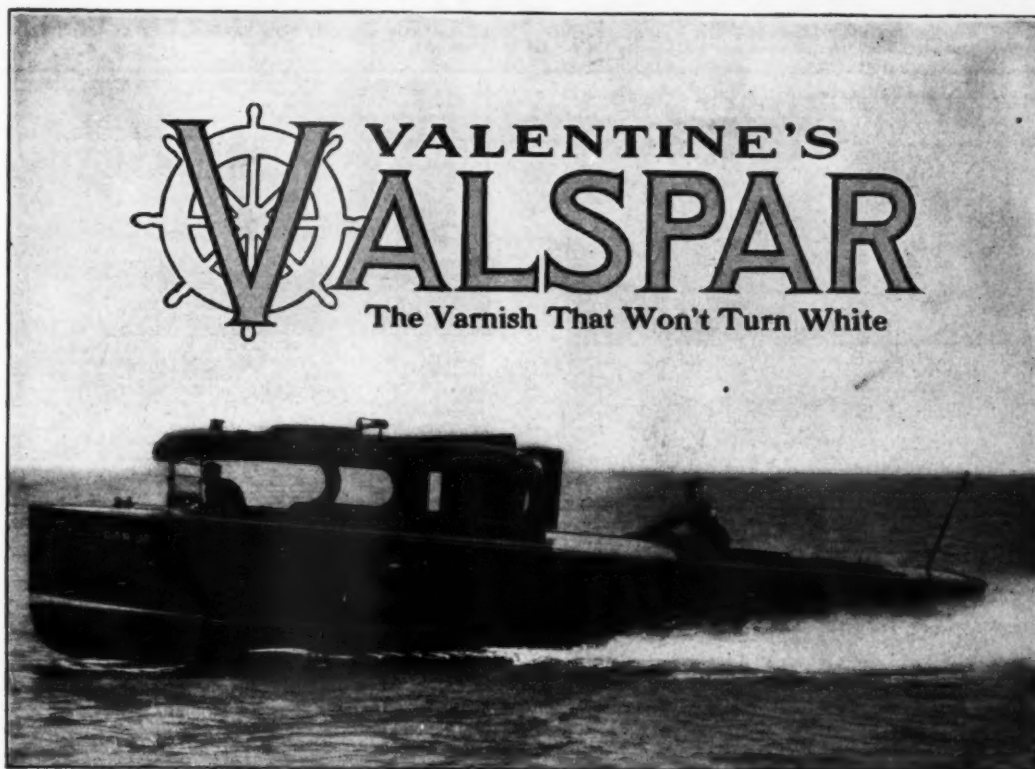
Typical of the confidence placed in American products is an order which is placed for ten engines by Rich. Bjorkman of Stockholm, Sweden. These will be of the medium-speed types, and equipped to operate on kerosene. Since the J. B. V. engine was only placed on the market last November and data concerning it could not have reached Sweden until December, it is plain to be seen that Mr. Bjorkman certainly did not waste any time in making up his mind regarding the merits of the American engine.

(Continued on page 78)



Built particularly for the race to Bermuda some years ago, Lady Baltimore has just been equipped with a pair of Model F.M. 8 cylinders Sterlings, with a total of 340 H. P., replacing a special pair of Hall Selley motors. She was designed by Bowes & Mower, and built by the Mathis Yacht Building Co., Camden, N. J. The new motors are expected to move Lady Baltimore along at about 20 miles an hour





*Gar Jr.—owned by G. A. Wood, Detroit; built by the C. C. Smith Boat & Engine Co., Algonac, Mich. This luxurious express cruiser, combines speed, reliability and comfort. She is Valsparred.*

## Gar Jr. is Valsparred

*And that's why she ran 8,370 miles without revarnishing*

*Gar Jr.* during the past season made 140 trips across Lake St. Clair, a 1200-mile cruise to the Thousand Islands and back via Lake Erie, the Erie Canal and Alexandria Bay, and fifty shorter trips.

From July 1 to November 10 she ran a total of 8370 miles, in all kinds of weather, *without repairs or revarnishing*. She was Valsparred, of course!

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*Motor Boat '99—2-20.*

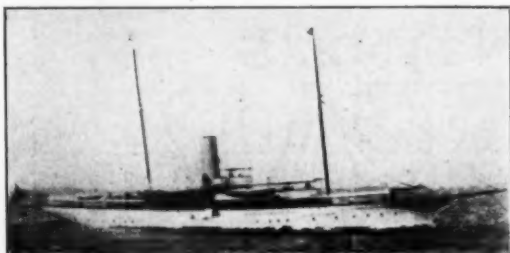
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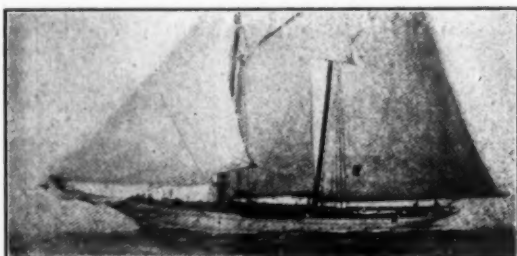
# COX & STEVENS

15 William St., New York  
Telephone—1375 Broad  
Cable—BROKERAGE

We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request.



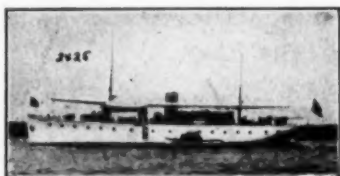
No. 71—For Sale—200 ft. seagoing steel steam yacht. Lloyds highest rating. Cox & Stevens, 15 William Street, New York.



No. 148—For Sale—Steel, flush deck, steam auxiliary schooner yacht; 130 ft. overall, 110 ft. waterline, 26 ft. beam, 13.6 ft. draft. Speed under power 9 knots; compound engine; electric lights; all conveniences. Extremely able craft; heavily constructed. Cox & Stevens, 15 William Street, New York.



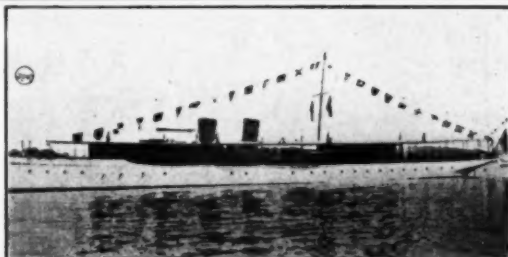
No. 2026—For Sale or Charter—Twin-screw cruising power yacht; 107 x 18 x 5.3 ft. Speed 11-12 knots; 75/90 H.P. Standard motors. Four staterooms, deck, dining saloon, bath and two toilets, etc. Recently completely overhauled at large expense. Cox & Stevens, 15 William Street, New York.



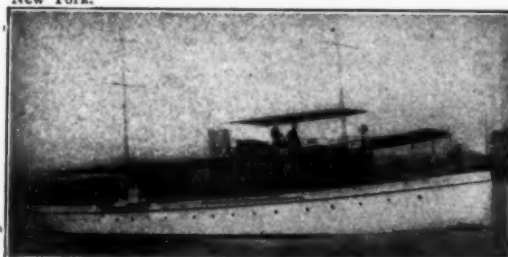
No. 2425—For Sale or Charter—Twin-screw cruising power yacht; 90 x 16.6 ft. Speed up to 12½ miles; two 6 cyl. 60/90 H.P. motors. Excellent accommodation. Cox & Stevens, 15 William Street, New York.



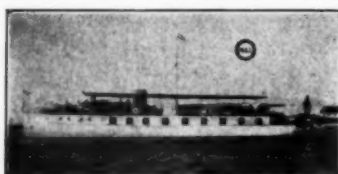
No. 1991—For Sale—Cruising power yacht; 81 x 12 x 4 ft. Speed up to 15 miles; 6 cyl. 100-120 H.P. "20th Century" motor. Dining room, three staterooms, toilet room, etc. Cox & Stevens, 15 William Street, New York.



No. 3047—For Sale—Particularly attractive 165 ft. fast oil-burning, twin screw, steel steam yacht. Speed up to 19 miles. Beautifully finished and furnished. Large accommodations include dining saloon and music room on deck, six staterooms and three bathrooms below aft. Cox & Stevens, 15 William Street, New York.



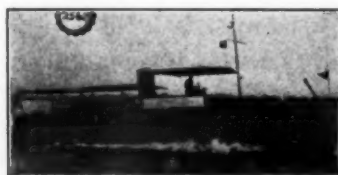
No. 1796—For Sale or Charter—Very roomy, twin-screw cruising power yacht, 99 x 17 x 4 ft. Speed 13 to 15 miles; Standard motors. Large dining saloon, six staterooms, three bathrooms, all conveniences. Cox & Stevens, 15 William Street, New York.



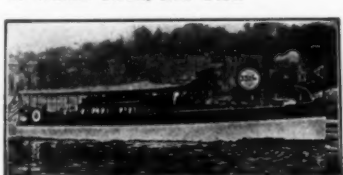
No. 1662—Charter—Attractive 90 ft. twin-screw gasoline houseboat; speed 10-12 miles. Large saloon, four staterooms, two bathrooms; all conveniences. Handsomely furnished. Cox & Stevens, 15 William Street, New York.



No. 1806—For Florida Charter—Twin-screw power yacht; 67 x 14.6 x 3 ft. draft. Speed up to 13½ miles; two 40 H.P. Sterling motors. Large saloon with two extension berths, two staterooms, bath and toilet, galley, etc. Roomy bridge deck and large cockpit. Price attractive. Cox & Stevens, 15 William Street, New York.



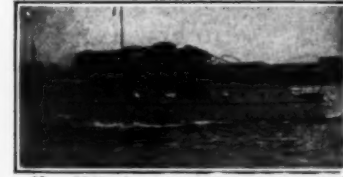
No. 2560—For Sale—Fast, V-bottom, twin screw power cruiser; 60 x 13 x 3 ft. Built 1917. Speed up to 18 miles; two 6 cyl. Sterling motors. Double stateroom forward; roomy saloon aft with separate galley; two toilet rooms (one with Sitz bath). Low price for quick sale. Cox & Stevens, 15 William Street, New York.



No. 3326—For Sale—Fast bridge deck cruiser; 55 x 8.9 x 3 ft. Speed up to 23 miles; 8 cyl., 200 H.P. Speedway motor. Two berths in cabin, toilet room, large cockpit, etc. Price attractive. Cox & Stevens, 15 William Street, New York.



No. 2000—For Sale—Twin-screw 69 ft. power yacht. Speed up to 13 miles; two 40 H.P. motors. Enclosed bridge, large dining saloon, two double staterooms, galley, etc. Splendid condition throughout. Cox & Stevens, 15 William Street, New York.



No. 3560—For Sale—Fast bridge deck cruiser; 45 x 10.6 x 3.6 ft. New 1917. Speed 18 miles; 125 H.P. 6 cyl. Sterling motor. Double stateroom, saloon, galley, toilet room, etc. Price reasonable. Cox & Stevens, 15 William Street, New York.

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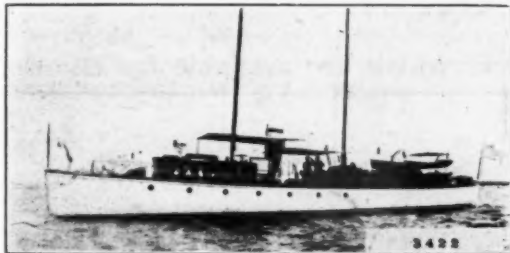
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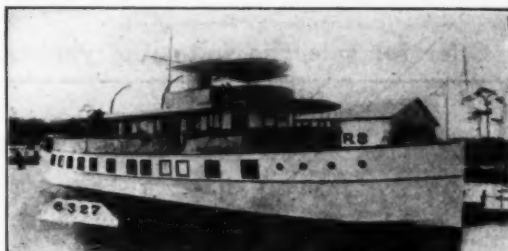
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We have a most complete and up-to-date list of power yachts of all sizes, sail, auxiliary and houseboats on file in our office, kept constantly up-to-date by a thorough and comprehensive canvass of the entire yachting field from time to time. We are in a position to submit full information on any type of boat upon request. FOR SOUTHERN CRUISING this winter we offer a number of very desirable POWER HOUSE BOATS and POWER YACHTS which are specially adapted for FLORIDA waters.



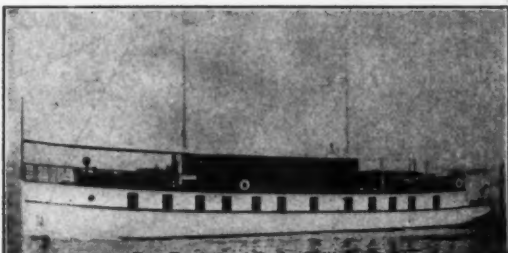
No. 3422—For Sale—Desirable 94 foot twin-screw steel power yacht. Deck dining room. Two double staterooms, bath and two toilets. Hot water heated. Standard engines. Speed 12 to 14 miles. Price reasonable. Henry J. Gielow, 52 Broadway, New York City.



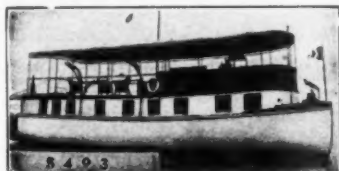
No. 6327—Sale or Charter—98 foot cruising houseboat. Built 1919. Owner's stateroom with adjoining bathroom and lounging room in deck house. Below five staterooms, three bathrooms and dining room. Henry J. Gielow, 52 Broadway, New York City.



No. 4401—For Sale—137 ft. very attractive twin screw motor yacht. Speed 15 to 16 miles. Built by Lawley. Deck dining room and smoking room. Three double staterooms. Hot water heated. Price attractive. Henry J. Gielow, 52 Broadway, New York City.



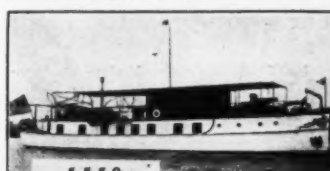
No. 5006—For Charter—Desirable twin screw 100 foot cruising houseboat. Speed 12 miles. Deck, dining room and lounging room. Seven staterooms, three bathrooms. Now in commission. Henry J. Gielow, 52 Broadway, New York City.



No. 5403—For Charter—Desirable 51 foot houseboat. Standard motor. Large deck space. Two double and two single staterooms. Electric lights. Accommodations for seven persons. Henry J. Gielow, 52 Broadway, New York City.



No. 2958—For Sale—Twin screw 120 foot steam yacht. Speed up to 24 miles. Deck dining room. Built by Seabury. Suitable for ferry or racing yacht tender. Henry J. Gielow, 52 Broadway, New York City.



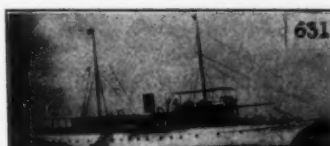
No. 5559—For Sale or Charter—Attractive 75 foot cruising houseboat. Standard engines. Deck lounging room. Three double and one single stateroom. Bathroom. Now in Florida. Henry J. Gielow, 52 Broadway, New York City.



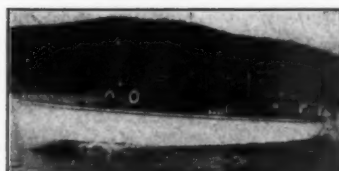
No. 2680—For Sale—Attractive 75 foot power yacht. Practically in commission. Two staterooms with double beds. Bathroom. Standard engine. Speed 12 miles. Able sea boat. Inspectable New York. Henry J. Gielow, 52 Broadway, New York City.



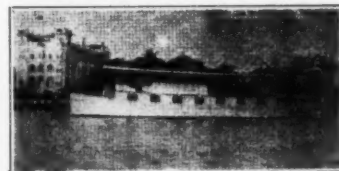
No. 6418—For Sale—72 foot twin screw bridge deck cruiser. Built 1917. Winton motors, 150 H.P. each. Deck dining room. Two double staterooms, and bathroom. Electric and hot water heated. Henry J. Gielow, 52 Broadway, New York City.



No. 6311—For Sale—115 foot twin screw steel power yacht. Standard motors, 100 H.P. each. Dining room in forward deck house. Social hall in after house. Four staterooms and bathrooms. Henry J. Gielow, 52 Broadway, New York City.



No. 3307—For Sale—Desirable 59 foot cruising power yacht. Standard engine. Double stateroom. Good sea boat, inspectable New York. Price attractive. Henry J. Gielow, 52 Broadway, New York City.



No. 6097—For Charter—Most desirable 62 foot cruising houseboat. Large deck, lounging room, dining room, one double and two single staterooms, bathroom. Now in southern waters, available for coming season. Henry J. Gielow, 52 Broadway, New York City.



No. 6417—For Sale—45 foot hand express day cruiser. Built 1918. Speed 22 miles. Toilet room. Cabin and galley. Large cockpit. Henry J. Gielow, 52 Broadway, New York City.



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No. 1927—Brand new houseboat available charter. Delivery Florida, February 1; 85 ft. overall, 19 ft. beam and 3 ft. draft, twin screw; 5 staterooms, 3 bathrooms and large deck saloon. Also sister ship for sale—Immediate New York delivery. Apply Tams, Lemoine & Crane, 52 Pine Street, New York.

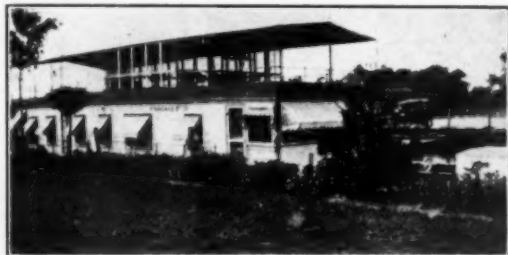
No. 1926—Sale—Brand new houseboat in Florida waters 98 ft. x 20 ft. x 3 ft. draft; 100 H.P. motor; 6 staterooms, 3 bathrooms, dining saloon, sitting room, electric light and hot water heat. Also available charter from January 1. Full particulars, plans, etc. From Tams, Lemoine & Crane, 52 Pine Street, New York.



No. 7992—For Sale—Modern steel motor yacht, 115 ft. 7 in. x 17 ft. x 5 ft. 3 in. draft. 2—100 H.P. Standard motors. Speed 15 miles. Commodious owners' quarters.



No. 1847—Available charter December, January, March and April, now in Florida waters, 85 ft. x 18 ft. x 23 ft. draft, 4 staterooms, bathroom, large dining and sitting rooms, etc.



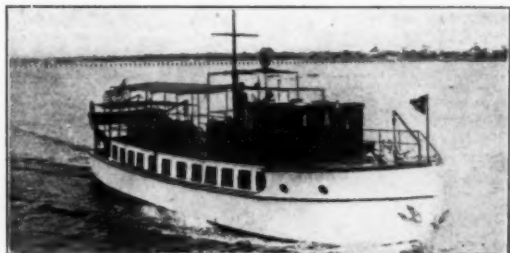
No. 1934—Sale Bargain, houseboat 61 ft. overall by 24 ft. beam, 4 staterooms, dining room, living room, conservatory, bath, etc., hot water heat, electric light and refrigerating plant. Most luxuriously fitted and furnished.



No. 8102—Sale—Charter; most desirable raised deck cruiser available; practically new, 81 ft. x 13 ft. x 5 ft. draft. Speed 15 miles, electric light, hot water, heat and refrigerating plant.



No. 1902—Sale or Charter—In Florida. Most commodious houseboat of her length available; 64 ft. x 17 ft. 6 in. x 3 ft. 2 in. draft.



No. 1908—Sale or Charter—62 ft. desirable cruiser; good accommodations, now in Florida waters; single screw. Speed 8½ to 9 miles.

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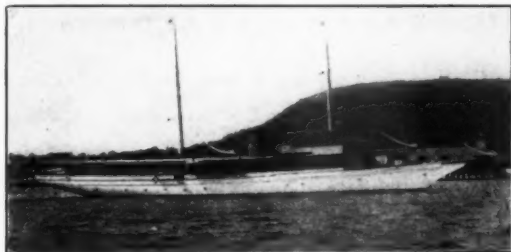
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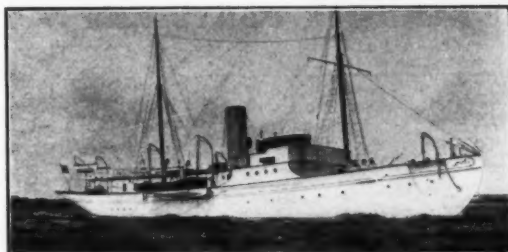
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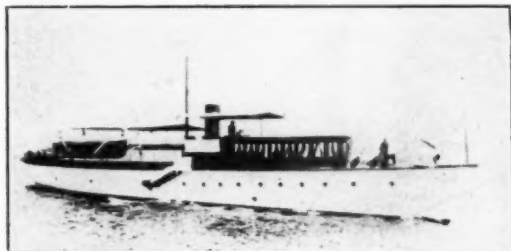
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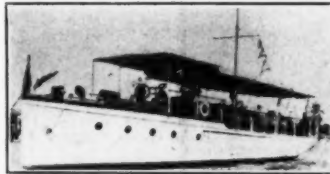
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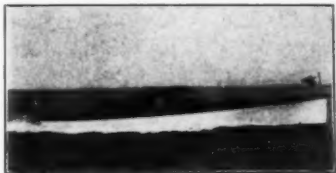
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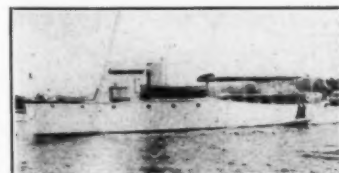
No. 1782—Bridge deck cruiser, 56 x 9.6, six cylinder, 100 H.P. motor, speed 16 miles.



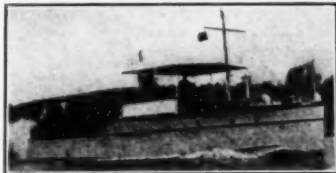
No. 2108—Fast Motor Boat, 40 x 5.6. 8 cylinder 175 H.P. Sterling engine, speed 22/25 miles. Mahogany finish.



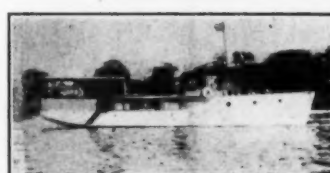
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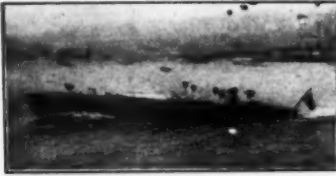
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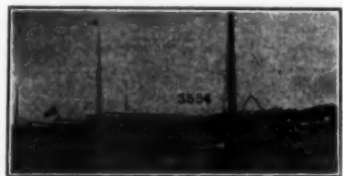
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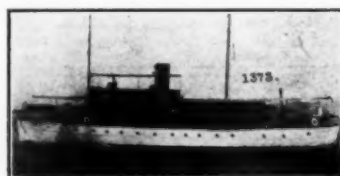
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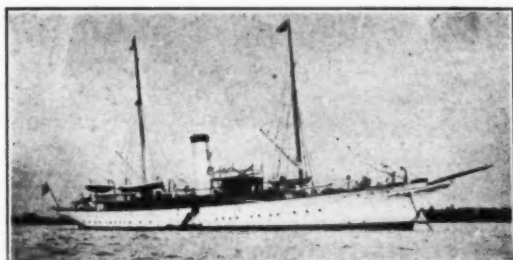
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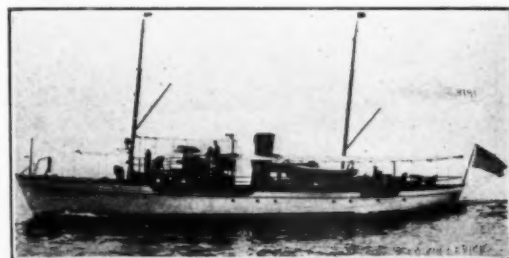
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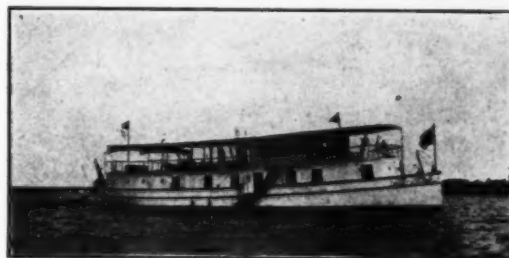
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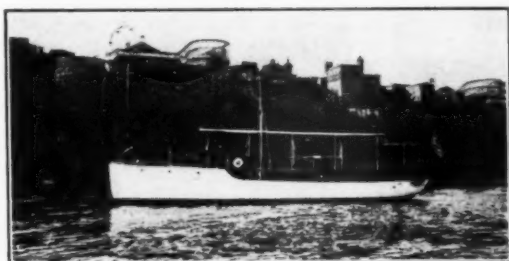
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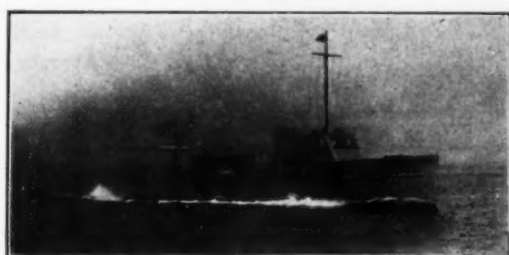
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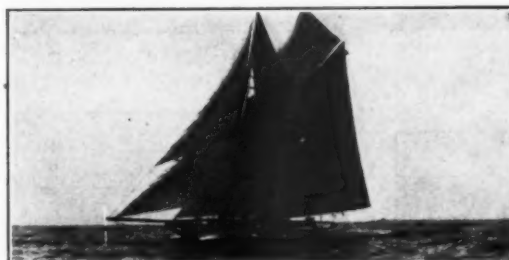
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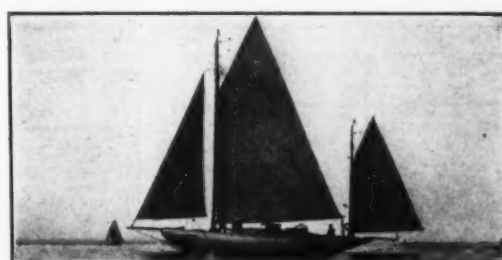
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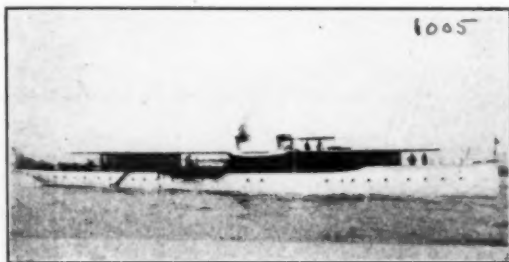
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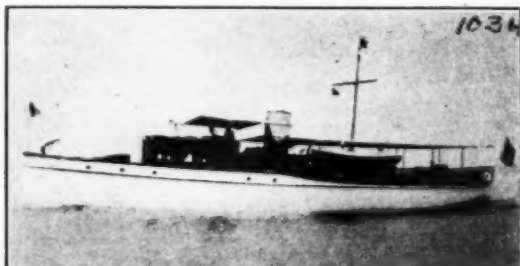
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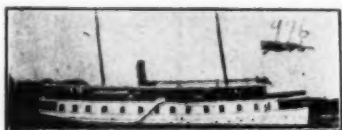
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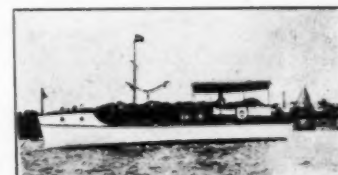
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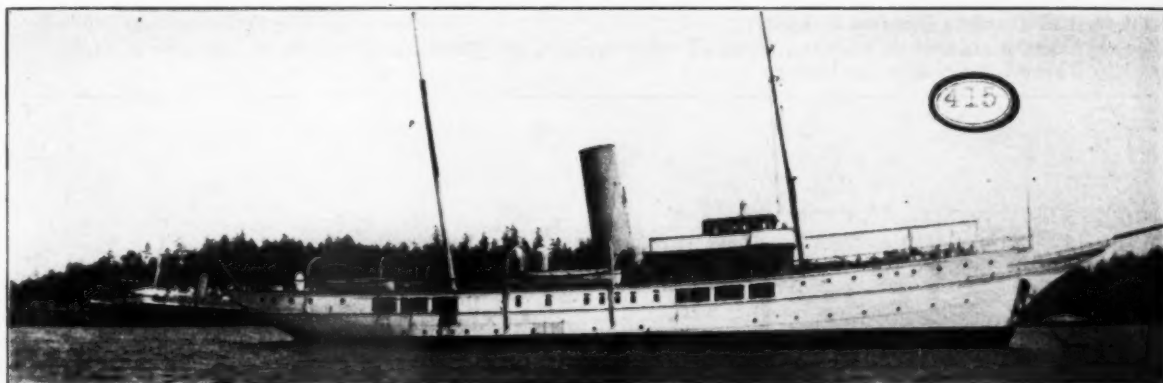
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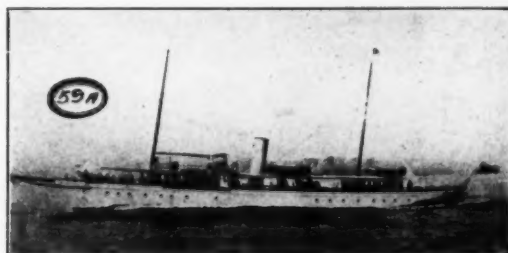
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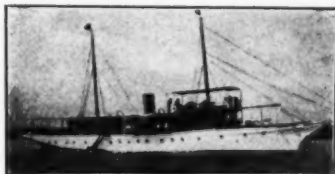
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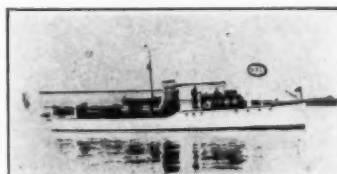
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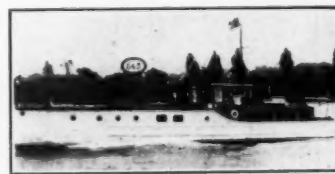
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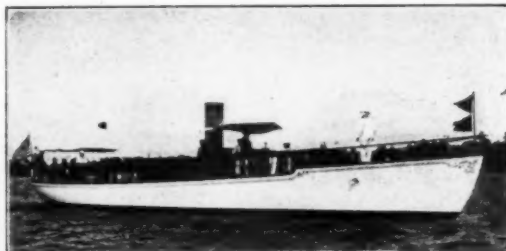
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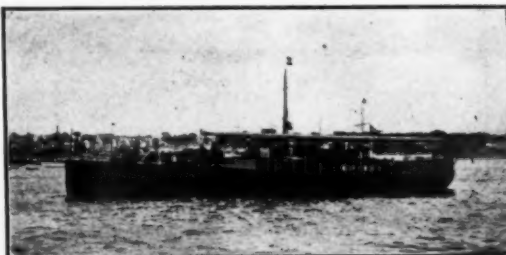
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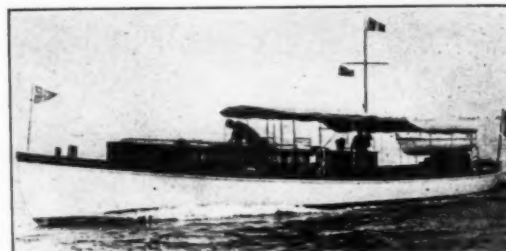
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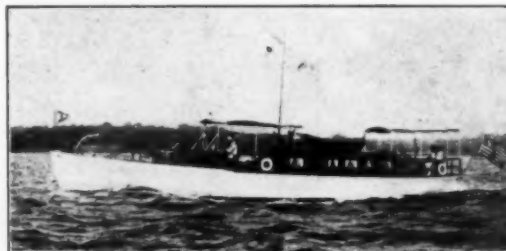
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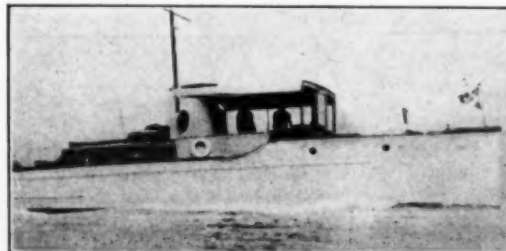
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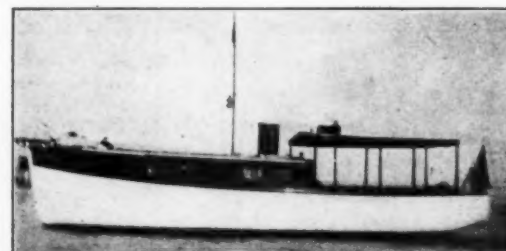
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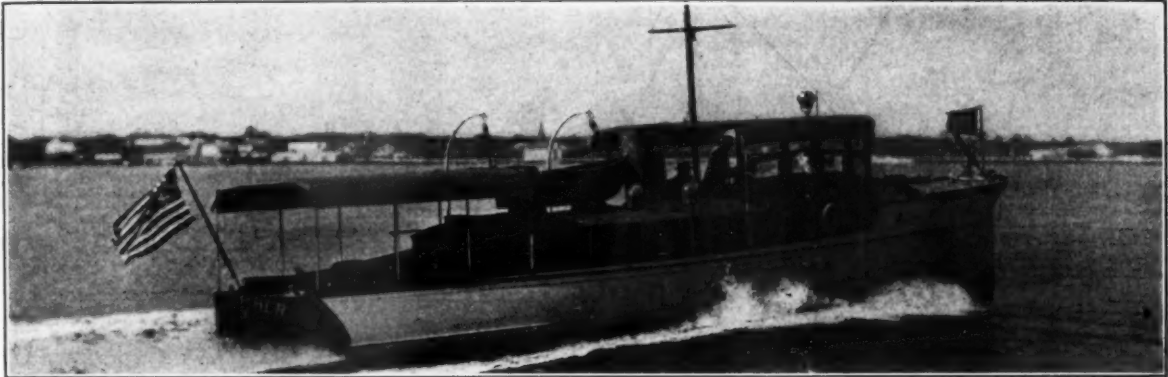
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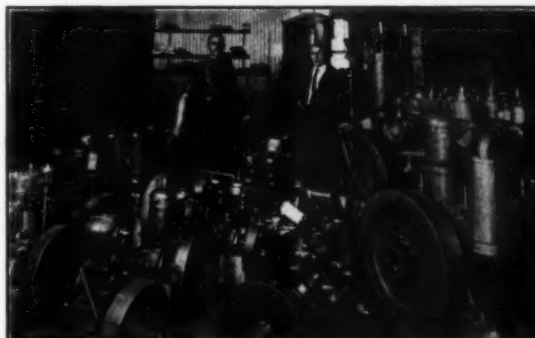
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10 H.P. Truscott 6½ x	7½ H.P. Fairbanks-Morse 75.	
	8-10 H.P. Gray with gear and wheel.....115.	
	8 H.P. Roberts with gear and wheel.....105.	

Also large line of auto engines, tractor and buy them. What have you? Badger Motor Com  
 stationary engines. Supplies of every nature at pany, Milwaukee, Wis.  
 very low prices. We take engines in trade and

When writing to advertisers please mention MoToR Boating, the National Magazine of Motor Boating

## THE MOTOR BOATING MARKET PLACE

The rate for "For Sale" and "Want" advertisements is 6 cents per word, minimum \$1.50. If an illustration is used, the charge is as follows, which includes the making of the cut:

Cut one inch deep, one column wide.....	\$ 5
Cut 1½ inches deep, 1½ columns wide.....	\$10
Cut 2¼ inches deep, three columns wide.....	\$20

Terms: Cash with order.

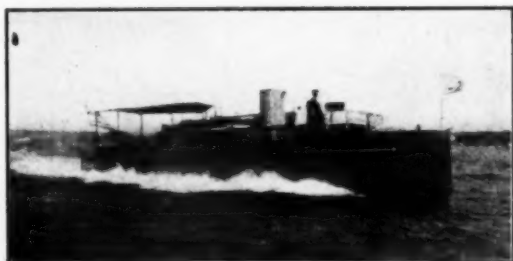
### Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR BoatinG.



ELCO SPEED BOAT.

To be sold, at once, a 36 foot ELCO SPEED BOAT, a fast, snappy-looking boat, bright, finished in mahogany, good equipment, brass appointments, engine in good condition, everything has been gone over and she is now newly painted and varnished ready for use, this is a bargain, for someone, if bought now. Can be seen and inspected at the DAUNTLESS SHIPYARD INC., ESSEX, CONNECTICUT, phone, write or call.



No. 1342—For Sale—High grade express cruiser, designed and built by Lawley, 1916, 43 ft. x 9 ft. x 3 ft. 150 h.p., 6-cylinder 5½ in. x 6¾ in. medium duty Sterling. Speed 18-22 miles. Two large cockpits, after cabin, two toilets, galley; forward cabin for paid hand. Represents Lawley's best workmanship. In beautiful condition throughout. Apply John G. Alden, 148 State Street, Boston.

High grade Mahogany Express Cruiser hull 26 ft. x 7 ft. A rare combination of style, speed, seaworthiness and the accommodations of a 30-footer at an extremely low price. Bronx Boat Works, foot of Willow Ave., near East 132nd St., New York City.

Use "SNAPPER" ENGINES for your small boat. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

For Sale—1-7-inch Deck Type Carlisle & Finch Arc Marine Search Lamp. Brass \$50.00. 1119 14th St. N.W., Washington, D. C., Percy M. Child.

CANADIANS, Second-hand engine bargains. Send for list.

GUARANTEE MOTOR COMPANY  
73 Bay Street, North Hamilton, Ont., Canada

For Sale: The 40 ft. raised-deck cruiser WACHUSETT complete to the minutest detail and every possible convenience. Double stateroom and saloon, sleeping 4 to 6 in owner's party. Price \$4,000. Cannot be duplicated for less than \$8,000. Ideal boat for trip to Florida. For complete description including photo write Castle, Lincoln Bldg., Phila., Pa.

Sale: 6 cyl. Pierce-Arrow 66 H.P. \$250.00. 3 cyl. Rice 2 cycle 20 H.P. with A. K. Ignition, reverse propeller and shaft complete \$140.00. 10 ft. and 5 ft. lengths bronze shaft 1½ inch diameter \$15.00 and \$7.00. Hor. Gray stationary 3½ H.P. (new) \$40.00. Hyde propeller (new) 20 x 24 inches. Gordon Baxter, Palmyra, N. J.

Wanted—1-1½ or 3 Kw. Direct Connected 110-volt Gasoline Electric Light Plant. Must be 4-cycle motor equal to No. 2 Carlisle & Finch Plant. Percy M. Child, 1110-14th St. N.W., Washington, D. C.

USED MATTHEWS ELECTRIC LIGHTING PLANTS. Automatic Marine and Land types—one and two kilowatts—32 volt—attractive prices—Widger & Miller Co., Matthews Dealers, 141 Milk St., Boston, Mass.

WANTED to buy second hand engine, large enough for 40 ft. boat. 18 or 24 H.P. Standard preferred, address Berthiaume Bros., Superior, Wis.

Wanted—Wherever there are boats, representatives to handle our speed indicators, taffrail logs, and marine meters selling from \$8 to \$65. Can you consider a good proposition? Write for details. Irvin W. Masters, Muncie, Ind., U. S. A.

For Sale: 60 H.P. Roberts motor with clutch, coil, magneto and rings. Price \$500.00. For information write A. C. Schultze, 646 S. Leebriek St., Burlington, Ia.

For Sale: 25/35 H.P. Peerless engine, gear, ignition, oil pump and carburetor. \$275.00. 3 cyl. Wolverine motor 6 x 6, gear, carburetor and distributor. Swings 28-inch wheel 325 R.P.M. \$250.00. 2 cyl. ten H.P. T. & M. engine, one-way clutch and carburetor. \$130.00. All in good running order. Soo Gas Engine Works Sault Ste. Marie, Mich.

For Sale—20 ft. x 5 semi-speed steel launch. 8 h.p. 2 cyl. 2 cys. marine motor with 3 blade Sintz Rev. Prop. good sea boat, speedy, full equipment, also truck for hauling, \$300.00. Frank H. Schultz, 539 Grove St., Milwaukee, Wisc.

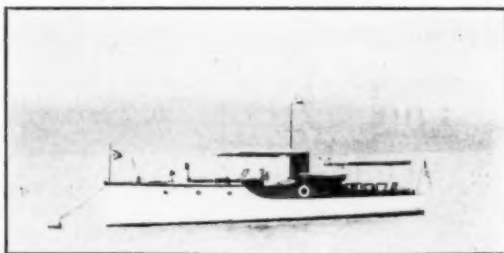
For Sale—20th Century engine, very little used, 2 cylinder, 4 cycle, 5¼ in. diameter, 7¼ in. stroke with 28 x 28 Hyde propeller. Electric generator with control; reverse gear. All of the above for \$400. Thomas Farmer, Jr., 348 Amsterdam Avenue, N. Y. C. Telephone, Schuyler 2990.

FOR SALE—Small wireless set, receiving and sending outfit, cost \$70.00; will take \$40.00. Percy M. Child, 1110 14th St. N. W., Washington, D. C.

FOR SALE—One 62 Ft. Motor Yacht. Standard Motor. Speed 10 Miles. \$7,000.00. Percy M. Child, 1110 14th St. N. W., Washington, D. C.

FOR SALE—1 40 Ft. Raised Cabin Cruiser. Sterling Engine, Speed 9 Miles. \$3,300. Percy M. Child, 1110 14th St. N. W., Washington, D. C.

FOR SALE: Raised Deck Cruiser 46 by 11. Fully equipped. Handsomely furnished. 45 R.P. Sterling. Bath tub, hot water, independent electric plant. One man control. In perfect condition. Price \$6,000. J. H. Egan, 236 S. 9th St., Phila., Pa.



For Sale: Fifty foot Bridge-deck Hand V-bottom cruiser with 4 cylinder 4 cycle 40-60 horsepower Buffalo motor. Separate electric light plant; large bath room fully equipped and found in every particular. Large forward stateroom sleeping four; engine room sleeping two and owner's stateroom. Interior finish mahogany and white enamel. Boat built in 1918. Used very little, in excellent condition and practically ready to go into commission. Complete equipment including round bottom dinghy. Speed 12 miles per hour. Inspectable New York City. Price \$15,000. Box 36 MoToR BoatinG. No dealers.

A WORTH WHILE CRUISER FOR SALE AT A WORTH WHILE PRICE. THE BOAT IS JUST SHORT OF SEVENTY FEET LONG; HAS A DRAFT OF FOUR FEET TWO INCHES, AND IS GOOD FOR FOURTEEN MILES AND PERHAPS TWO MILES BETTER IF YOU PUSH HER. SHE IS HEATED BY STEAM AND HAS A SHOWER BATH; THREE STATE ROOMS; THREE TOILETS; AMPLE CREW'S QUARTERS; A REAL ENGINE ROOM. JUST ABOUT EVERY CONVENIENCE AND FITTING THAT ONE COULD DESIRE. SHE CAN BE SEEN NEAR NEW YORK. GLAD TO TELL YOU MORE ABOUT HER IF YOU ARE INTERESTED, BUT TO SAVE YOUR TIME AND MINE I WILL MENTION THAT HER PRICE IS FOURTEEN THOUSAND DOLLARS. P. O. BOX 214, CARLISLE, PA.

### BARGAINS

### BARGAINS

#### EAGLE TWO CYCLE ENGINES

We purpose to close out at greatly reduced prices our entire stock of "Eagle" two cycle engines, as we intend to discontinue the manufacture of this type of engine in the future. Write at once for information to the

TORRINGTON COMPANY  
STANDARD PLANT  
Torrington, Conn.

Latest model, 40 H. P. Lathrop engine, 4 cylinder, 4 cycle with reverse gear, magneto and coils. Price \$800. Engine used only part of one season. Wm. Schiff, 80 Maiden Lane, N. Y.

FOR SALE: 24 foot motor boat with two cylinder Palmer engine, jump spark ignition, Paragon reverse gear, fully equipped with automobile top and all accessories. Built 1910. In excellent condition. Speed 8 miles. Price \$600.00, inspectable. Boothbay Harbor, Maine. Address Colwell, 303 Caton Ave., Brooklyn, N. Y.

FOR SALE—New, raised deck hull, twenty-eight feet by eight feet, heavy construction, cedar planking, copper fastened and plugged, ready for engine. Mattituck Boat Works, Mattituck, N. Y.

Sailor for a long time, wants a job as Motor-boat Navigator or Operator. Have been running Power boat for long time, have got license for 65 foot power boat, well known on the coast of U. S. A. Write A. Pedersen, 124 West York St., Norfolk, Va.

FOR SALE—Cruising houseboat 41 x 11 x 3—engine room aft—then galley, main cabin, toilet and washroom, forward stateroom; 20 H.P. engine; electric light, price \$1000. Boat seen at Schenck's boat yard, foot Bay 46th St., Gravesend Bay, Brooklyn, N. Y. Owner, Henderson, 403 Clermont Ave., Brooklyn, N. Y.

WANTED—Draftsman of experience on small boat work. Albany Boat Corp., Watervliet, N. Y.



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For Sale at Brandentown, Florida (west coast): 37 foot motor boat, hand V-bottom type, four-cylinder Van Blerck engine; speed 15-18 miles; sleeps two; excellent for fishing in Gulf. Apply Box 7, MoToR BoatinG, 119 West 40th St., N. Y. C.

For Sale—31 ft. raised deck cruiser, 2 years old. Sleeps 6 people. 4 cylinder 20 H.P. Peerless motor, galley, ice box, range, toilet. 2 anchors and rope. 14 ft. tender and all the equipments. Speed 9 miles. Cost \$5,000 to build. Price \$2,000 cash. Geo. McConnell, 2548 Linden St., Brooklyn, N. Y.

WANTED—Cabin cruiser, about 40 feet long. Engine and hull must be in first class condition. M. H. Baker, 416 Broome St., New York City.

FOR SALE: 8 horsepower Dunn Motor. Salt-water equipments. Also Gies reverse gear for same. Never been used. Have decided to install larger motor. Will sell together or separate. A Bargain. Robert Wright, c/o Muskogee Plumbing Co., Muskogee, Oklahoma.

FOR SALE: ¾ K.W. Standard 30 Amp. 50 Volt Dynamo, for cell charging, in A1 condition. C. C. B., Apt. 70, 44 West 44th St., N. Y. C.

Auto Motors Supplies—Buick, Michigan, Stoddard, Dayton, Hupp 32, Cadillac, Overland, E.M.F., Continental and Buda motors. All types \$50 each and up. Bosch Magneto, \$15 each and up. Special High Tension 2 and 4 cylinder magnetos, \$9.50 each. Prest-O-Lite Tanks, \$5.00. Coils, Carburetors, Air Compressors, Generator, Starters, etc. Write for Bargain Bulletin. Second Hand Auto Accessories. Address Motor Sales Dept. B, West End, Pittsburgh, Penna.

FOR SALE—Boat Yard 100 ft. by 150 ft. Two story shop 30 ft. by 60 ft. Electric Motor for hauling out and running shop machinery. Thirty-eight boats now in yard for winter storage. Splendid opportunity for a live boat builder to obtain an up-to-the-minute yard and shop. Inquire E. E. Crampton, Morris Cove, New Haven, Connecticut.

## Erecting Engineer

A well known manufacturer of high grade marine gasoline engines has opening for a high-class erecting engineer who has had experience and is capable of supervising large installations. Apply by letter stating experience, reference and salary expected. Address

MoToR BoatinG, Box 1

## SERVICE MEN

A well known manufacturer of high grade marine gasoline engines has opening for a number of good service men. Apply by letter stating experience, reference and salary expected. Address

MoToR BoatinG, Box 2

## Bargains Bargains Bargains

We have for sale the following rebuilt Marine Engines which are guaranteed to be in good condition. These engines are a bargain at the prices listed below and they warrant investigation.

Model	Type	Price
J-6 RH	(Van Blerck) .....	\$1650.00
J-8 RH	(Van Blerck) .....	2000.00
6-cyl.	(Sterling) .....	3150.00
4-cyl.	(Sterling) .....	350.00
4-cyl.	(Van Blerck Tractor) .....	800.00
M-4 RH	(Van Blerck) .....	1500.00
EE-4 RH	(Van Blerck) .....	1600.00
E-6 RH	(Van Blerck) .....	1000.00
E-6 LH	(Van Blerck) .....	1000.00
J-8 RH	(Van Blerck) .....	1000.00
J-8 LH	(Van Blerck) .....	1000.00

**VAN BLERCK MOTOR COMPANY**  
MONROE, MICHIGAN

# Here's Your Chance to Get a First-Class Rebuilt Engine

Ask for a Description of Whatever Sizes Interest You

Our Guarantee Is Your Protection

Exchange your present engine for a new one.

We will make you a most liberal allowance.

Our leaders: Sterling, Kermath, Gray-Prior, Universal, Doman and Wolverine, 4-cycle; Hartford and Arrow, 2-cycle.

Missouri Oil Engines, quick starting, economical, easy to operate.

**ALL OF OUR ENGINES ARE MOST CAREFULLY REBUILT IN OUR SHOPS BY OUR OWN SKILLED MECHANICS AND ARE FULLY GUARANTEED**

**QUOTATIONS ON OUR REBUILT MOTORS ARE SUBJECT TO PRIOR SALE. WE THEREFORE REQUEST THAT YOU WIRE US TO HOLD FOR YOU THE MOTOR WHICH YOU SELECT, FOLLOWING WITH DEPOSIT BY FIRST MAIL. THERE WILL BE A NOMINAL CHARGE MADE FOR CRATING, ACCORDING TO THE SIZE OF THE ENGINE.**

Description	Price	Description	Price
250-300 H.P. Van Blerck, 12 cyl., 4 cycle, 5½ x 6, complete with two Bosch magnetos, two Schebler carburetors, reverse gear, etc., complete up to and including coupling .....	\$2500	70 H.P. Mason Enclosed type D, 4 cyl., 4 cycle, 5½ x 6, without reverse gear but with electric self starter, Bosch magneto, etc., complete up to coupling, 1000 to 1500 R.P.M. (If desired reverse gear will be attached at extra cost), brand new .....	\$850
225-250 H.P. Sterling, 8 cyl., 4 cycle, high speed type, used very little and fully guaranteed, with carburetor, Bosch 2-point ignition, reverse gear, valve in head, etc., with one year guarantee .....	2000	70 H.P. Mason Enclosed type D, 4 cyl., 4 cycle, 5½ x 6, with reverse gear, electric self-starter, carburetor, Bosch magneto, etc., complete up to and including coupling, 1000 to 1500 R.P.M., 1140 lbs., brand new .....	1100
225 H.P. Jenick, 8 cyl., 7½ x 7½, with Bosch magneto, reverse gear, coll, etc., complete to coupling, as is ..	2500	70 H.P. Thelma, 6 cyl., 4 cycle, 5½ x 5½, with reverse gear, carburetor, coll, etc., complete up to and including coupling, also propeller, weight 1000 lbs., practically new .....	950
200 H.P. Sterling, 8 cylinder, 4 cycle, 5½ x 6½, Model F, complete with electric starter outfit, magneto, coll, carburetor, reverse gear, etc., complete up to and including coupling, one year guarantee .....	3000	70 H.P. Sterling, six cylinder, heavy duty 6½ x 9, with coll magneto, carburetor, reverse gear complete up to and including coupling .....	3400
200 H.P. Sterling engine, 8 cyl., 4 cycle, 8½ x 10, model D, heavy duty, with magnetos, coils, reverse gear, etc., brand new. Can be fitted to operate on kerosene ..	6800	60-85 H.P. Doman, 6 cyl., 4 cycle, 7 x 9, brand new, with high tension magneto, coll, carburetor, kerosene attachments, reverse gear, etc., complete up to and including coupling, 1 year guarantee .....	2500
Twin 200 H.P. Each Van Blerck, 8 cyl., 6 x 6, complete with electric starting and charging outfit, magnetos, carburetors, etc., complete up to and including couplings, also propellers, practically brand new condition, each .....	2800	60-70 H.P. Buffalo, 6 cyl., 4 cycle Heavy Duty 7 x 9 complete with Bosch dual magneto and coll, also Atwater-Kent ignition system, Schebler carburetor, reverse gear, etc., complete up to and including coupling, weight 4850 lbs., all rebuilt and ready for immediate shipment .....	2500
For the pair .....	5200	60 H.P. Loew Victor, 6 cyl., 4 cycle, 4½ x 5½, complete with carburetor, coll, electric starting and charging outfit attached, reverse gear, etc., complete up to and including coupling .....	1250
150-200 H.P. Mason enclosed type "D" 8 cyl., 4 cycle, 5½ x 6, complete with reverse gear, carburetor, Bosch magneto, electric self starter, etc., complete up to and including coupling, 1000 to 1500 R.P.M., 1590 lbs., brand new .....	2500	60 H.P. Speedway, 6 cyl., 4 cycle, 6 x 6, with carburetor, coll, spark plugs, reverse gear .....	1200
150-180 H.P. Sterling, 8 cyl., 5½ x 6½, Model "R", with Bosch magneto, two Schebler carburetors, reverse gear, etc., complete up to and including coupling .....	2000	60 H.P. Speedway, 6 cyl., 4 cycle, 6 x 6, with carburetor, magneto, coll, reverse gear and propeller .....	1400
160 H.P. Mason Enclosed type D, 6 cyl., 4 cycle, 5½ x 6, power plant without reverse gear, but complete with electric self starter. Bosch magneto, carburetor, etc., complete up to and including coupling (if desired reverse gear will be attached on extra iron frame at extra cost), 1000 to 1500 R.P.M., brand new .....	1350	60 H.P. Lamb, 6 cyl., 4 cycle, 6½ x 7, carburetor, coll, magneto, reverse gear, propeller .....	1800
130-160 H.P. Jager engine, 8½ x 12, heavy duty, with coll, carburetor, spark plugs, Bosch magneto, reverse gear, complete back to and including coupling .....	4000	60 H.P. Sterling, 6 cylinder, 6½ x 8, with high tension Bosch dual magneto, carburetor, coll, reverse gear, complete back to and including coupling .....	2850
135 H.P. Sterling Model "R-1," 6 cyl., 4 cycle, high speed, 5½ x 6½, complete with Bosch magneto, Schebler carburetor, oiling system, reverse gear, etc., complete up to and including coupling; one year guarantee .....	2000	60 H.P. Emerson, 6 cyl., 2 cycle, 5 x 5, with coll, carburetor and coupling, as is .....	350
110-148 H.P. Van Blerck, six cylinder, 1918 Model M, four cycle, complete with electric starter, reverse gear, carburetor, etc., complete up to and including coupling ..	2400	50-65 H.P. Vorback, 4 cyl., 4 cycle, heavy duty, 8 x 10, complete with Schebler carburetor, Bosch magneto, coll, etc., complete to coupling; also 36" three blade propeller, 8' of 2" bronze shaft .....	1500
100 H.P. Sterling, 8 cyl., 4 cycle, 5½ x 6, with carburetor, coll, Bosch high tension magneto, reverse gear, oiler, propeller, as is .....	500	50 H.P. Craig, four cylinder, four cycle, heavy duty, with carburetor, coll, reverse gear, complete up to and including coupling .....	1800
Twin 110-130 H.P. each Speedways, 6 cyl., 4 cycle, 5½ x 7, Model "M," latest type, complete with electric starters, carburetors, reverse gears, etc., complete up to and including couplings, for the pair .....	4000	50 H.P. Hitchcock, four cylinder, four cycle, with carburetor, coll, reverse gear, 8½ x 9 .....	1200
one engine only .....	2200	50 H.P. Automatic, 4 cyl., 4 cycle, 7½ x 9, with carburetor, coll, magneto, reverse gear and propeller .....	1200
90 H.P. Sterling, Model "R", 1500 R.P.M., 4 cyl., 4 cycle, complete with Bosch magneto, carburetor, coll, reverse gear, etc., complete up to and including coupling, electric starter .....	1550	50 H.P. Hitchcock, 8 x 9½, with carburetor, coll, reverse gear and propeller .....	1400
80 H.P. Mason Jager 6 cyl., 6½ x 9, heavy duty, enclosed type G, Bosch magneto, coll, carburetor, spark plugs, electric starter, reverse gear, all complete back to and including coupling, used less than 10 hours ..	3400	48 H.P. Barber, 6½ x 6½, complete with coll, carburetor, coupling, spark plugs, as is .....	250
75 H.P. Craig, 800 R.P.M., 4 cyl., 4 cycle, 1500 lbs., 6½ x 7, with carburetor, coll, reverse gear, etc., complete up to and including coupling .....	1200	45-65 H.P. Sterling, six cylinder, four cycle, 5½ x 6, with Schebler carburetor, Bosch magneto, oiling system, reverse gear, etc., complete up to and including coupling .....	1500
		45 H.P. Sterling, 4 cyl., 4 cycle, heavy duty, 6½ x 9, complete with Bosch magneto, carburetor, coll, reverse gear, etc., complete up to and including coupling, same one year guarantee as with a new Sterling ..	2200
		45 H.P. Doman, 6 cyl., 4 cycle, 6 x 6, with carburetor, Bosch dual magneto, coll, spark plugs, Paragon reverse gear, mechanical oiler, complete up to and including coupling, used only sixty hours .....	1450
		45 H.P. Holmes, four cylinder, four cycle, 6 x 8½, with carburetor, coll, Bosch dual magneto, and reverse gear .....	900
		40-50 H.P. Hall, 6 cyl., 4 cycle, 5½ x 6½, carburetor, Bosch magneto, coll, reverse gear, propeller outfit .....	1400

Advertising Index will be found on page 208

Description	Price	Description	Price
40-50 H.P. Speedway, 4 cylinder, 4 cycle, 6½ x 8, Model C, heavy duty, complete with mechanical oiler, Schebler carburetor, Bosch magneto, reverse gear, etc., complete up to and including coupling.....	\$1600	15-18 H.P. Capitol, 3 cyl., 2 cycle, carburetor, coil reverse gear.....	\$125
40-50 H.P. Anderson, 6 cyl., 4 cycle, 5 x 6, complete with carburetor, coil, spark plugs, magneto, rear starter, reverse gear, etc., complete up to and including coupling.....	1250	14 H.P. Truscott, 5¼ x 5¼, 2 cyl., 4 cycle, with coil, carburetor and reverse gear.....	295
40 H.P. Sterling, heavy duty, 4 cyl., 4 cycle, 6½ x 8, complete with carburetor, coil, reverse gear, air pump, bilge pump, Bosch magneto, etc., complete up to and including coupling, also 32 in. propeller, with one year guarantee.....	2000	14 H.P. Buffalo, 4 cyl., 4 cycle, with carburetor, coil, oiling system, reverse gear, etc., complete up to and including coupling.....	450
37½ H.P. Anderson, 3 cyl., 4 cycle, 7 x 8, heavy duty, with carburetor, coil, reverse gear, etc., complete up to and including coupling.....	1000	14 H.P. Stanley, 2 cyl., 2 cycle, carburetor, coil, spark plugs, reverse gear.....	180
32-37 H.P. Standard, 4 cyl., 4 cycle, 6 x 8, carburetor, coil, magneto, reverse gear.....	1600	14 H.P. Mohawk, 2 cyl., 2 cycle, carburetor, muffler, coupling.....	110
30-40 H.P. Brown, 4 cyl., 2 cycle, coil; carburetor and spark plugs.....	250	12-16 H.P. Eddystone Globe, 2 cyl., 2 cycle, 5¼ x 5 with carburetor, coil, magneto, shaft, propeller, stuffing box.....	225
30-50 H.P. Sterling, 4 cyl., 4 cycle, 5¼ x 6, with electric self-starter, carburetor, coil, reverse gear, etc., complete up to and including coupling, one year guarantee..	1550	12 H.P. Leighton, 4 cyl., 2 cycle, 4 x 4, make and break ignition, coil, oiling system, etc., complete up to and including coupling.....	100
28 H.P. Lackawanna, four cylinder, two cycle, carburetor, coil, coupling, spark plugs.....	175	12-15 H.P. Sterling, heavy duty, 2 cyl., 4 cycle, 5¼ x 7, with carburetor, coil, spark plugs, Bosch magneto, reverse gear, etc., complete up to and including coupling, one year guarantee.....	650
25-30 H.P. Wisconsin, Type "T," 4 cyl., 4 cycle, 4 x 6, practically new, without reverse gear but with governor, carburetor, and magneto. (If desired reverse gear will be attached on angle frame at extra cost)...	450	12 H.P. Lamb, carburetor, coil and reverse gear.....	325
25 H.P. Du Brie, 3 cyl., 2 cycle, with carburetor, coil, Atwater Kent distributor, magneto and reverse gear..	200	12 H.P. Twentieth Century, 5¼ x 7¼, 2 cyl. 4 cycle, heavy duty, carburetor, coil, magneto, reverse gear.....	450
25 H.P. Tuttle, 2 cyl., carburetor, coil, spark plugs, propeller	225	12 H.P. Hall, 2 cyl., 4 cycle, carburetor, coil, one-way clutch, 5 x 7.....	325
22 H.P. Knox, 3 cyl., 2 cycle, with carburetor, coil, reverse gear and propeller.....	290	12 H.P. Roberts, three cylinder, two cycle, with Atwater-Kent ignition, coil and reverse gear.....	145
21 H.P. Campbell, 3 cyl., 4 cycle, 5¼ x 6¼, carburetor, Atwater Kent ignition, reverse gear.....	650	10-12 H.P. Harris, 2 cylinder, 4 cycle, 4¼ x 6, with carburetor, Atwater-Kent ignition and propeller.....	350
21 H.P. Clifton, 3 cyl., 4 cycle, 6¼ x 7, carburetor, magneto, coil, reverse gear.....	750	10 H.P. Tuttle, 2 cyl., 2 cycle, carburetor, Perflex ignition and coupling.....	110
20-35 H.P. Sterling, 4 cyl., 4 cycle, 4¼ x 5¼, complete with oiling system, Bosch magneto, coil, carburetor, reverse gear and electric starter.....	1200	10 H.P. Globe, 2 cyl., 4 cycle, 6 x 7, unit plant with reverse gear, carburetor, coil, propeller.....	475
20-25 H.P. Vim, 2 cyl., 2 cycle, 5 x 5, with carburetors; coil; Delco ignition and reverse gear.....	180	10-12 H.P. Racine, 2 cyl., 2 cycle, with carburetor, as is.....	60
20 H.P. Ferro, 4 cyl., 4 cycle, with carburetor, coil, Bosch magneto, reverse gear, etc., complete up to and including coupling.....	450	10 H.P. Otto, 2 cylinder, 4 cycle, carburetor, coil, reverse gear.....	250
20 H.P. Fox, 2 cyl., 2 cycle, carburetor and oiler.....	150	8-10 H.P. Sterling, 2 cylinder, 4 cycle, 4¼ x 6, complete with mechanical oiling system, carburetor, reverse gear, etc., complete up to and including coupling, one year guarantee.....	525
20 H.P. Mason Type "L," 2 cyl., 4 cycle, 6¼ x 8, with reverse gear, carburetor, ignition outfit, Bosch magneto, jump spark, 450 R.P.M., complete up to and including coupling.....	750	8 H.P. Rochester, 2 cyl., 2 cycle, with carburetor, coil, spark plug and reverse gear.....	135
20 H.P. Reynolds, 4 cylinder, 4 cycle, with carburetor, coil, reverse gear, etc., complete up to and including coupling.....	275	7½ H.P. Mianus, single cyl., 2 cycle, complete with grease cups, ignitor, carburetor, etc., complete up to and including coupling.....	100
20 H.P. Sterling, two cylinder, 6¼ x 8, Bosch magneto, coil, carburetor, spark plugs, reverse gear.....	1000	7½ H.P. Lozier, with carburetor, coil and coupling, as is, prop. outfit.....	45
20 H.P. R. C. H. automobile engine, with carburetor and coil, only, not overhauled, to be sold, "as is." Running in a boat until day it was taken out and replaced with a larger motor.....	75	7 H.P. Eagle, 2K, brand new, with paragon reverse gear..	165
20 H.P. Beaton, 2 cyl., 4 cycle (as is).....	50	7 H.P. Fairfield, carburetor, coil, muffler and coupling, as is.....	55
18-25 H.P. Sterling, 4 cyl., 4 cycle, 4¼ x 5¼, complete with carburetor, coil, mechanical oiler, Bosch magneto, reverse gear, etc., complete up to and including coupling, one year guarantee.....	750	7 H.P. Hubbard, two cylinder, two cycle, with carburetor, coil, coupling.....	145
18 H.P. Eagle, 3 cylinder, 2 cycle, three carburetors, coupling, coil, new Paragon reverse gear.....	290	6-8 H.P. Belchia, 2 cyl., 2 cycle with carburetor, coil, spark plugs and coupling, as is.....	60
18 H.P. Roberts, three cylinder, two cycle, jump spark, with carburetor, coil and coupling.....	150	Two 6 H.P. Ferro, 2 cyl., 2 cycle, complete with spark plugs, carburetor, coil and reverse gear.....	100
17-25 H.P. Sterling, 1919 Model, with electric self-starting outfit, carburetor, coil, magneto, reverse gear, etc., complete up to and including coupling, one year guarantee.....	1000	6 H.P. Gile, two cylinder, two cycle, jump spark, with carburetor, coil and spark plugs.....	95
16-25 H.P. Hubbard, 4 cyl., 4 cycle, 4¼ x 5¼, complete with reverse gear, carburetor, oiler, etc., complete up to and including coupling.....	550	6 H.P. Red Wing, 2 cyl., 2 cycle, with carburetor, coil, spark plugs.....	90
16-18 H.P. Palmer, 2-cyl., 4 cycle, 6¼ x 8, Model F 2, with Atwater-Kent ignition, coil; carburetor and reverse gear.....	550	5 H.P. Truscott, one cylinder, two cycle, jump spark, with coil, carburetor and coupling, as is.....	40
16-20 H.P. Speedway, 4 cylinder, 4 cycle, carburetor, coil, Bosch magneto, spark plugs, reverse gear, splendid condition.....	550	5 H.P. Dutton, single cyl., 2 cycle, carburetor, muffler, coupling, as is.....	45
15-20 H.P. Scripps, 4 cyl., 4 cycle, 3¼ x 4, with magneto, coil, carburetor, reverse gear, etc., complete up to and including coupling.....	350	5 H.P. Little Giant, single cylinder, 2 cycle, with carburetor, coil and spark plugs.....	55
15-18 H.P. Lackawanna, 2 cyl., 2 cycle, carburetor, coil, muffler, One-Way Clutch, all in excellent condition	160	5 H.P. Howard, one cylinder, 2 cycle, carburetor, coil, spark plugs and coupling, as is.....	80
		5 H.P. Royal, carburetor, coil, coupling, as is.....	45
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## The Evolution of a Cruiser

(Continued from page 17)

to be broadened. Faster cruisers began to be called express cruisers, and soon every boat that was a little faster than ordinary was termed an express cruiser. This was not strictly speaking, correct, as the definition of an express cruiser was the same as that of the cruiser, except that the minimum waterline breadth restriction does not apply, and the rating may exceed seven and one-half times the square root of the waterline length.

Increases in the speed of boats, and particularly in express cruiser classes here necessitated further revisions in the classifications. There are in existence today a few super-express cruisers. Boats equipped with powerful high-speed motors, and built like a hydroplane. With speeds in excess of 35 m.p.h. the accepted variety of express cruiser was far outclassed. This caused the addition of a new classification at the last annual meeting of the American Power-Boat Association not long ago.

The term speed cruiser was applied to all boats whose rating exceeds fifteen times the square root of the waterline length. The limitations of the express cruiser place it in the range of ratings between seven and one-half and fifteen times the square root of the waterline length. While the cruiser is one which rates under seven and one-half times, the square root of the waterline length. This may all sound strange to the motor boatman who has not kept posted in matters of this kind, and a little explanation might be useful. For the purpose of clarification let us assume an imaginary boat with a waterline length of thirty-six feet, the square root of which would be six. To fit in the cruiser class this boat must rate not to exceed seven and one-half times six, or 45.0, this divided by the constant 4.167, will give the approximate speed in knots which this boat should attain or 10.9 knots. As soon as the rating exceeds this amount and up to the upper limit of fifteen times the square root of the waterline length or 90, the boat would be classified as an express cruiser and its speed would be again 90 divided by 4.167 or 22 knots. When the rating runs still higher and exceeds fifteen times the square root of the waterline length we have a boat in the new class or a speed cruiser. With a rating of over 90 a boat in this class must be capable of a speed of more than 22 knots. Of course all these figures apply only to the particular boat under discussion. Any other boat with a waterline length under or over this example will not necessarily fall in the same class at all.

The definitions for all classes of boats as they will appear in the 1920 year book of the American Power Boat Association are about as follows:

Division I. Cruisers. A cruiser is a power boat whose rating is not less than five and one-half times the square root of the waterline length and whose rating does not exceed seven and one-half times the square root of its waterline length as calculated by the formula for determining the rating of cruisers, with permanent berths, fixed and sanitary plumbing, cooking arrangement and outfit necessary for living aboard. It must have a cabin, not glass, entirely closed in and either flush deck or self-bailing cockpit. Non-water-tight hatches, if any, in decks or cockpits, or over engine compartments, shall have water-tight coamings surrounding them at least 6 inches high.

Cabin to have a space under carlins and above frames and floor timbers equal in

(Continued on page 78)

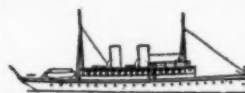
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General view of the Murray & Tregurtha plant at Atlantic, Mass.



Stock room, with Fellows gear shapers and Gleason bevel gear cutter in foreground

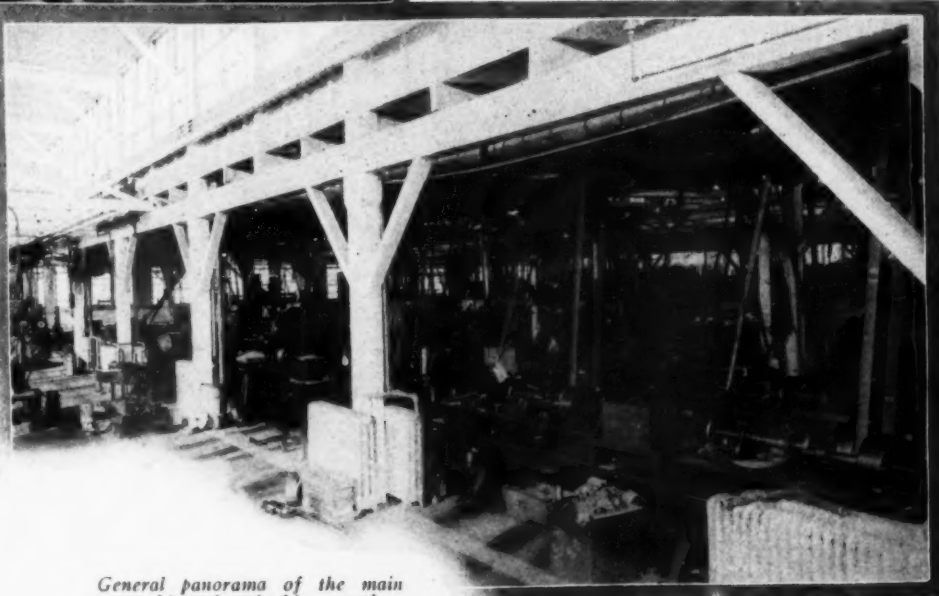
quires capital and plenty of it at that. A very striking example of this confidence in the future of the industry is the liberal support of capital to the great expansion recently made in the plant and business of the Murray & Tregurtha Corporation.

For thirty-three years the Murray & Tregurtha Company were well known as very conservative yacht and engine builders, and

turned out in this period numerous examples of the finest types of yachts and engines, keeping pace at the same time with all the modern developments and progress in the field of gas engine practice.

On the first of February, 1919, the Murray & Tregurtha Company was incorporated and the name changed to the Murray & Tregurtha Corporation. New capital was enlisted and the officers and officials of the reorganized company adopted a revised policy which changed the entire program of the plant. Owing to the tremendous and incessant demand for high class, high power marine engines of light weight it was decided to abandon the boat building program entirely and devote the full capacity of the spacious new plant at Atlantic, Mass., to the manufacture of gasoline engines, in an endeavor to supply some of the demand.

This plant at Atlantic was started early in 1918, at a time when the nation was crying for help to devise means for combating the submarines, in response to an appeal from the Navy Department of the Government. They desired particularly that some of the fine boat building talent of the Murray & Tregurtha workshop be set to the task of supplying the need for sea-plane hulls. The main boatbuilding yard of the company at South Boston was busily engaged in turning out sea sled hulls at the same time and its capacity was taxed severely in keeping up with the demand for these from the Navy Department.



General panorama of the main machine shop looking north



*General view of the main machine shop looking south*

The main factory building is of one-story, brick and concrete construction, and is divided into three machinery bays, running the full width. Facing one of Boston's main boulevards are the executive offices. Back of these are two sections filled with machines used in finishing the rough castings and forgings. Automatic machines take care of such operations as gear cutting, cylinder boring and grinding, etc. Multiple spindle drills are used, in connection with jigs, to bore all holes in any piece at one time, insuring absolute uniformity and interchangeability.

In the center of the building, and running its entire width, is the stock room and pattern storage room.

The assembly bay faces the railroad, and is amply lighted from all sides. Here expert mechanics, many of whom have been in the service of Murray & Tregurtha for years, assemble the motors with painstaking care.

This bay has two aisles, with three rows of parts tables, all served by a continuous overhead monorail carrying Shepard electric hoists. When the engines are complete, they are run out of either of the large

doors visible in the background of the picture of the assembly bay shown herewith. The monorail extends into the modern testing building, which has a floor area of 4000 sq. ft. Here, by the use of a series of overhead switches, the engine may be deposited on any one of the five testing blocks. These blocks are made up of steel members, solidly bedded in concrete, and are equipped with the latest type Sprague Electric Dynamometers.

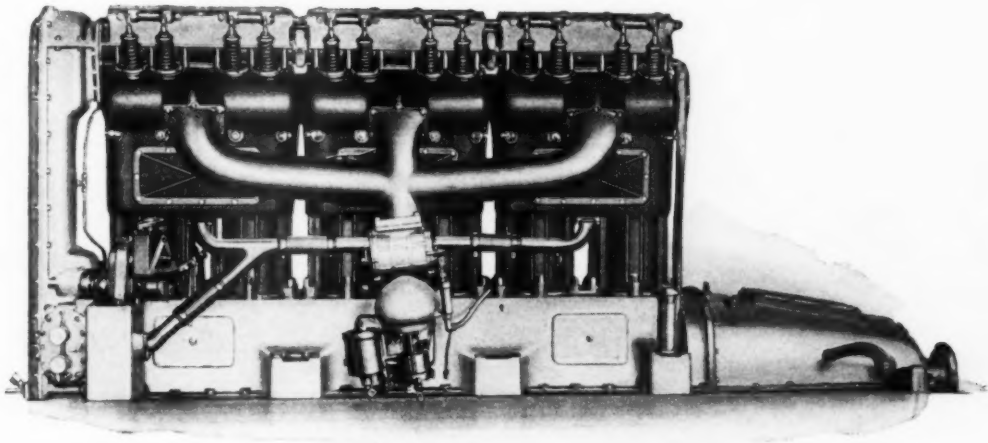
Space is provided in the testing building also, for the sand blasting room, the oil storage room, and the main switches and transformers, all machinery in the plant being operated by electricity.

An interesting part of this big plant is the testing room. All Murray & Tregurtha motors are given a final test on a Sprague Electric 400 h.p. Dynamometer. This testing device is the most accurate and precise method of determining just what a motor is able to do. An electric generator can be calibrated so that its output of current is known for every revolution. The results are absolutely accurate and beyond question, a permanent record of performance being obtained.



*Assembly bay, where motors are completed before going to test room beyond*





MODEL J-6

## America's Premier High Speed Engine

400 H. P. AT 1400 R. P. M.

**T**RIOUMPHANT, after its first season's tryout in civilian yachts, the opening of the 1920 season finds the Model J-6 engines firmly established as the ideal power plant for the finest and fastest express cruisers afloat.

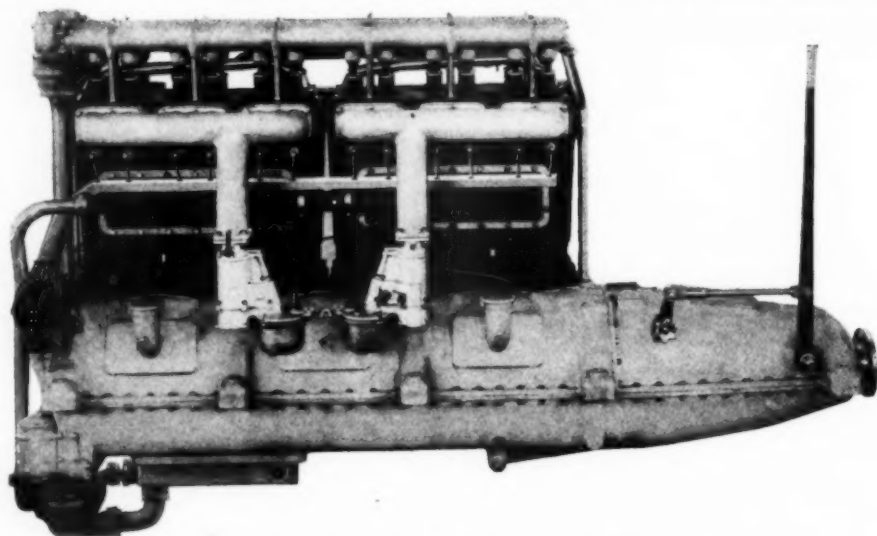
Remarkable speed is possible by using these engines in your boat. Attaining the extreme of power, Model J-6 engines are built of the finest of materials and with such precision of adjustment that they have remarkable stability and endurance.

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## ANNOUNCING Model K-6

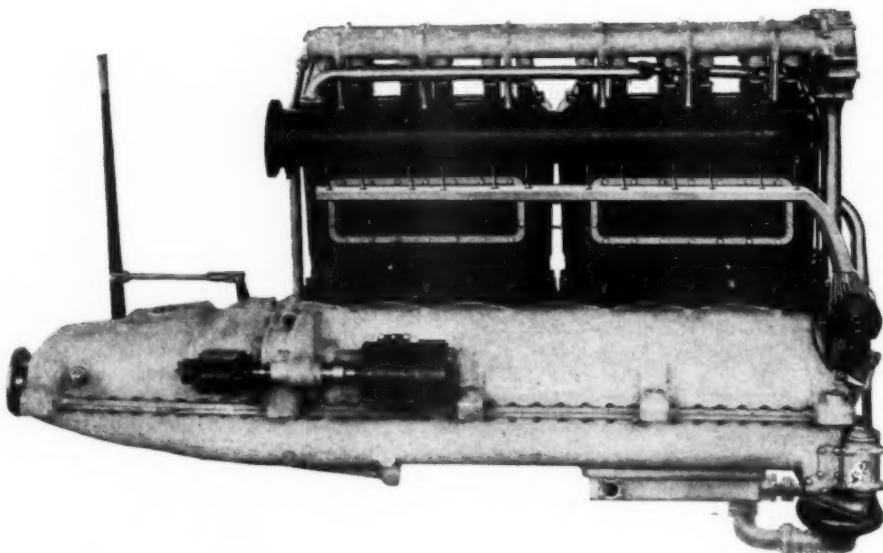
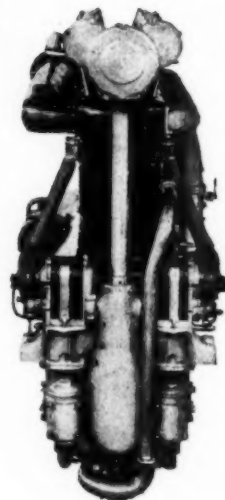
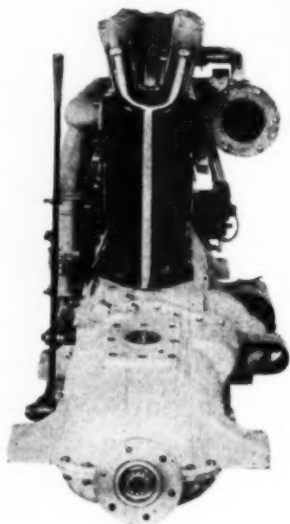
300 H. P.

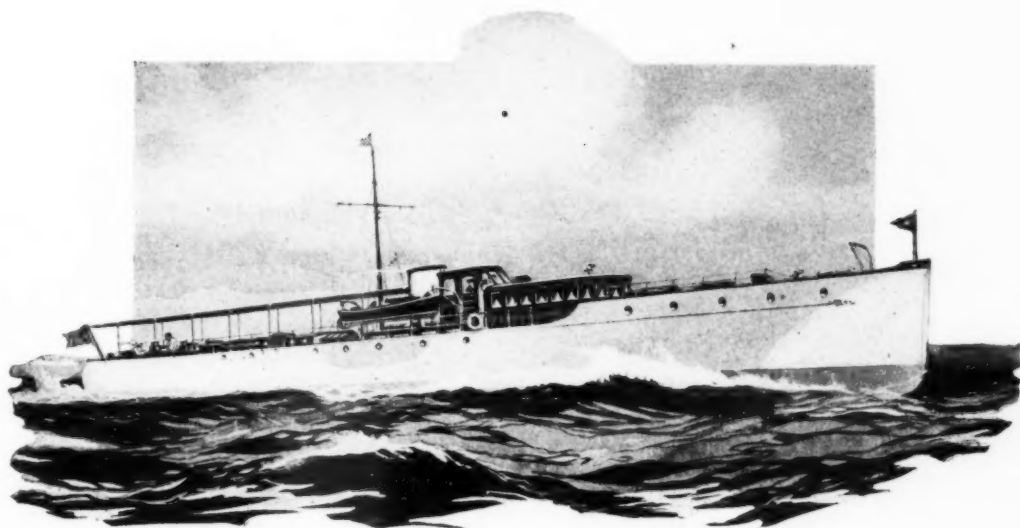
TO satisfy the demand for a smaller and lighter engine of the same general type as our well known Model J-6, we introduce

### Model K-6

Six cylinders,  $6\frac{1}{4}$ " bore,  $7\frac{3}{4}$ " stroke. Four overhead valves per cylinder. Four spark plugs per cylinder. Weight 2100 pounds. 300 H.P. at 1500 R.P.M.

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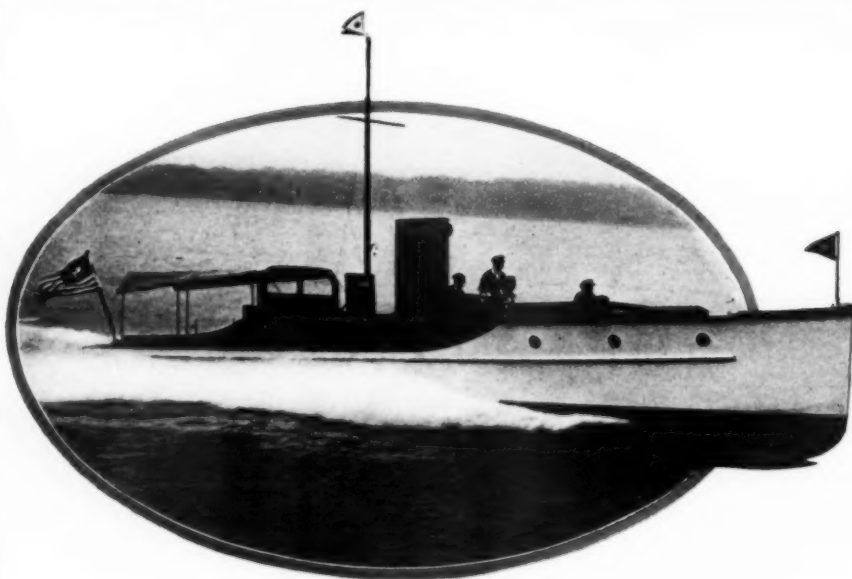


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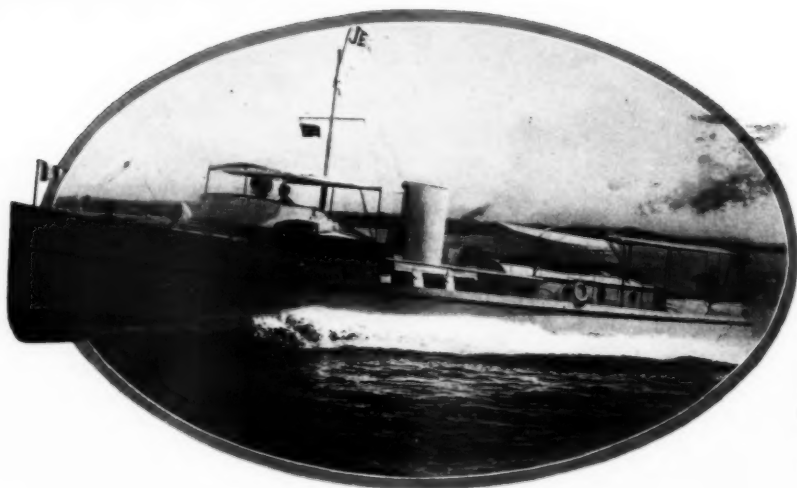
**D**ESIGNED and built by the Great Lakes Boat Building Corporation, of Milwaukee, Wis., for the late John F. Dodge, of Detroit, Mich.

This boat now building, will be the finest and most up-to-date craft of this type afloat. The power plant will consist of four 400 H.P., Model J-6 engines, which will give a speed of better than 30 miles per hour.





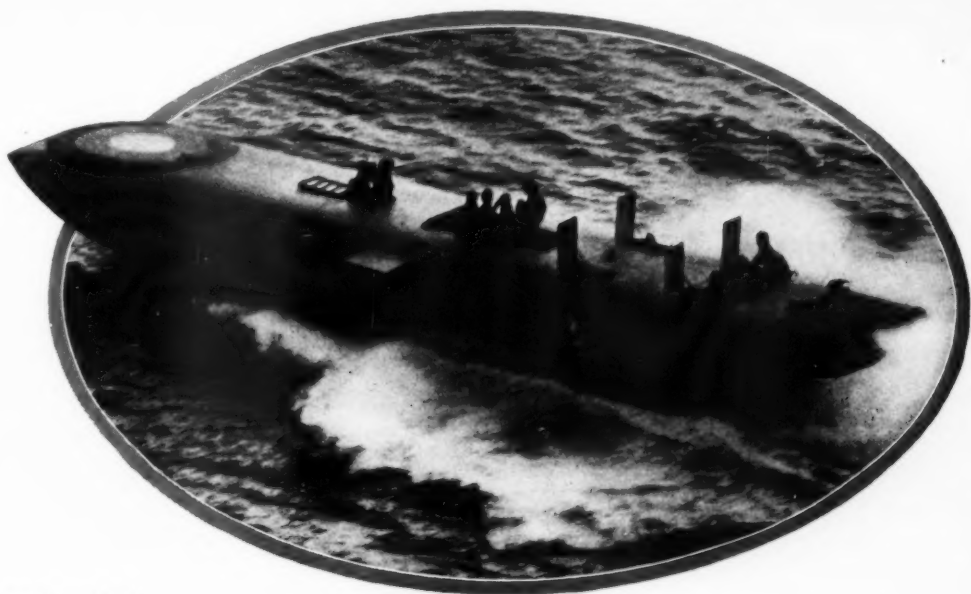
CIGARETTE, 55' x 10'2" x 4'7", owned by L. Gordon Hammersley, of New York. Designed by Wm. H. Hand, Jr., of New Bedford, Mass., and built by Robert Jacob, City Island, N. Y. Empowered with two 400 H.P. Model J-6 engines; speed better than 35 miles per hour.



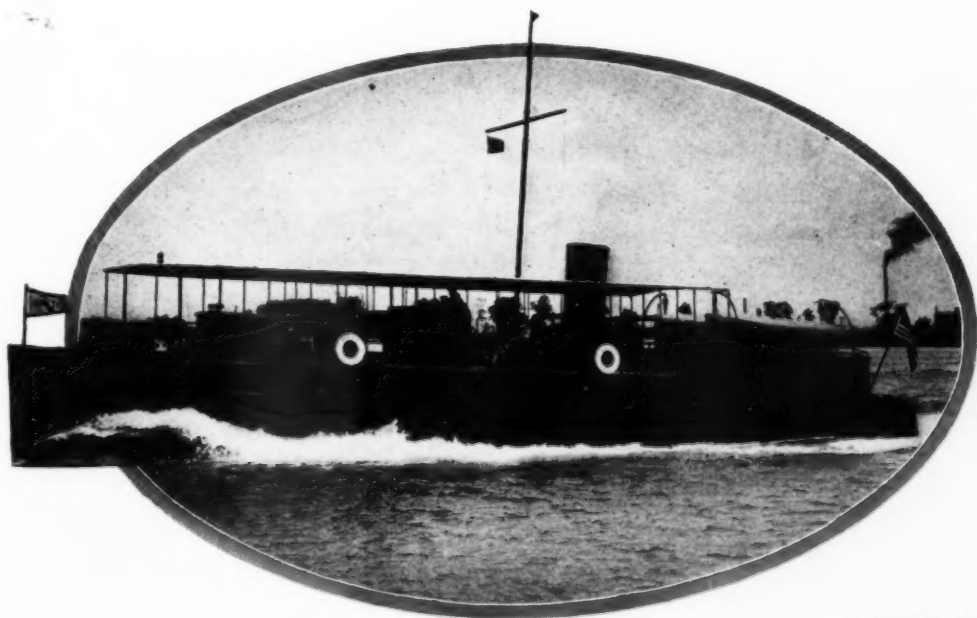
INQUIRER, 62' x 11'6" x 3'9", owned by Col. James Elverson, Jr., of Philadelphia and New York; speed 33.82 statute miles. Built by Mathis Yacht Building Corp., of Camden, N. J., from the design of A. Loring Swasey. Power plant, two Model J-6.



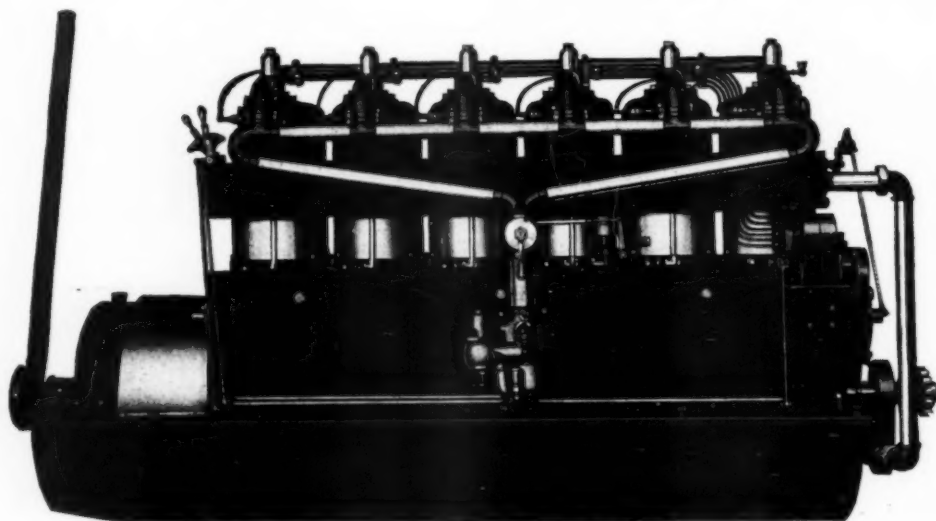
WHIPPET, 72' x 12', owned by Oliver G. Jennings, of Newport and New York. Twin Model J-6 engines; speed over 30 statute miles. Designed and built by Greenport Basin & Construction Co., Greenport, L. I.



55' Navy Sea Sled, planned for use as airplane carrier; 12'6" beam, 5'6" depth. Powered with four Model J-6 engines; speed 53 statute miles at 1300 R.P.M.



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Model F-4, 4 cyl., 7½" bore, 10" stroke, 60 H.P. at 375 R.P.M.

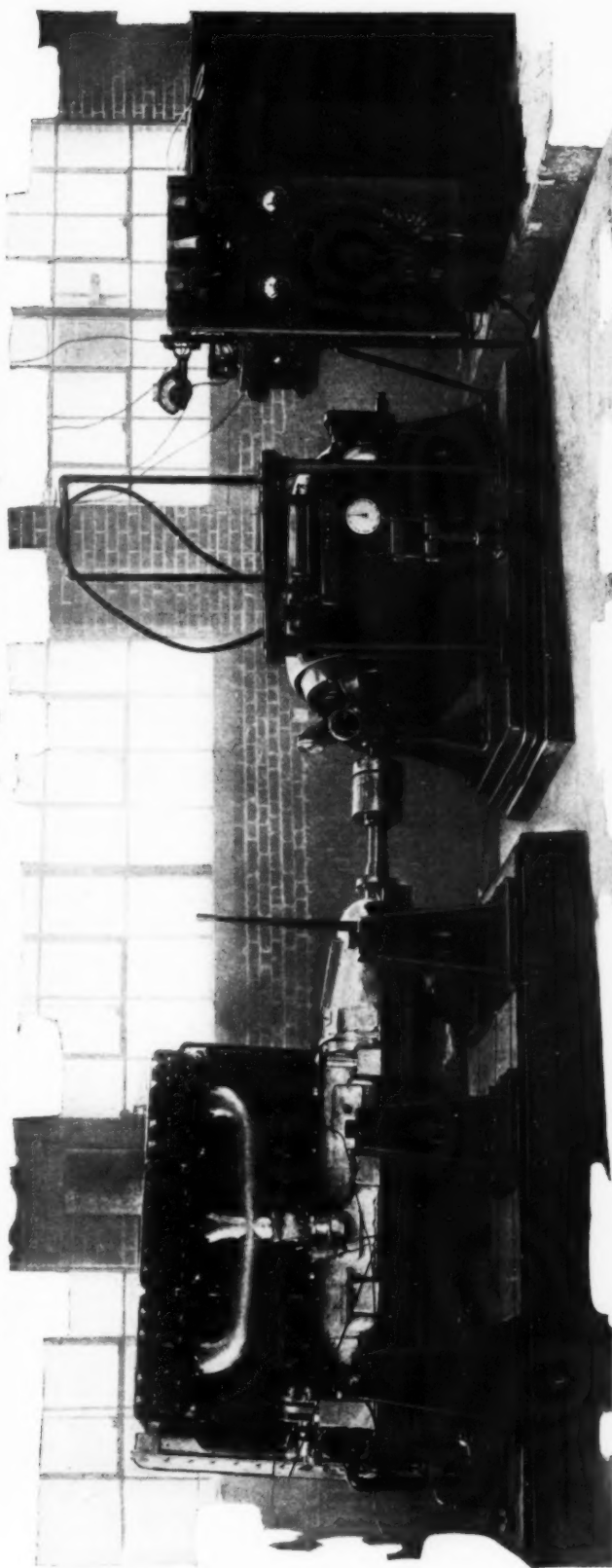
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**Atlantic, Mass.**



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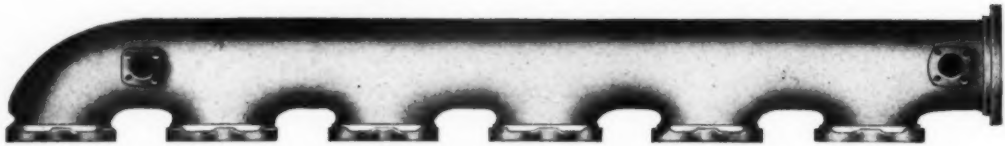


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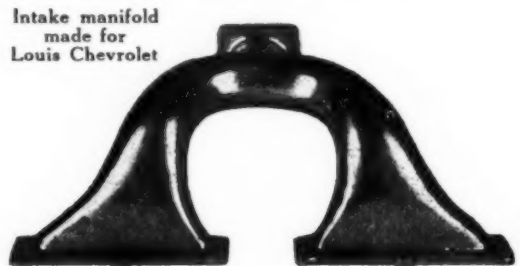


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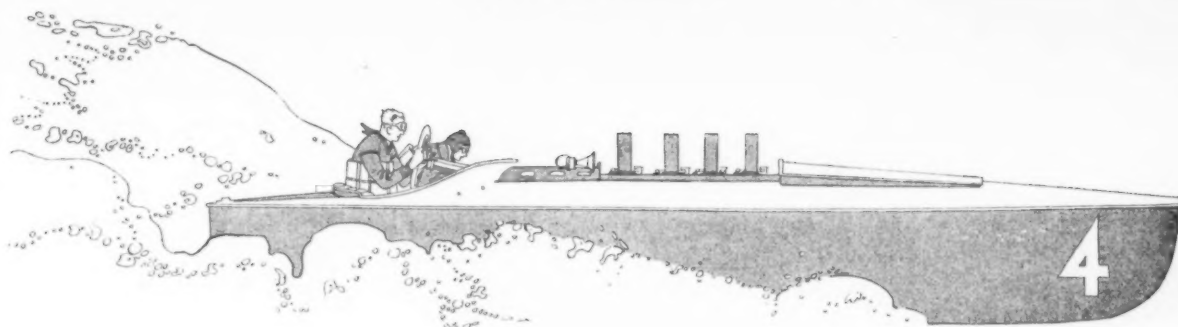
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## The Evolution of a Cruiser

(Continued from page 64)

height to 16 per cent. of the overall length of boat up to 6 feet. This space to extend for one-quarter of the length of the boat and for one-quarter of the maximum beam and may be occupied by engine cabin floor, berths or other equipment or construction. The waterline breadth shall be equal to or greater than the load waterline divided by nine, plus three feet.

Fuel to be carried in fixed tank or tanks. Fresh water to be carried in fixed tank or tanks. Full equipment as required by law and effective ground tackle shall be carried in races. Small boats and other equipment as advertised by the Race Committee.

Division 2. Express Cruisers. An express cruiser is to be defined as a cruiser except that the minimum waterline breadth restriction shall not apply and that the required height of space shall be 12½ per cent. instead of 16 per cent. up to 6 feet for ¼ the waterline length and ¼ the maximum beam—and the rating falls between the limits of seven and one-half times the square root of the waterline length and fifteen times the square root of the waterline length.

The express cruiser class shall also include those boats which would normally fall in the cruiser class except that their rating exceeds seven and one-half times the square root of the waterline length.

Division 2 a. Speed Cruisers. A speed cruiser is to be defined as an express cruiser except that the rating may exceed fifteen times the square root of the waterline length. In determining whether a cruiser's, express cruiser's, or speed cruiser's rating exceeds seven and one-half times the square root of the waterline length, the formula for determining the rating of cruisers shall be used.

Division 3. Open Boats. An open boat is one weighing sixty or more pounds per rated horsepower or a boat not included in Divisions 1, 2, 4, or 5.

Division 4. Displacement Racers. A displacement racer is a boat weighing less than 60 pounds per rated horsepower when in racing trim. The racer horsepower to be used in determining this.

Division 5. Hydroplanes. A hydroplane is a racing boat whose propeller acts in or against the water, and which has one or more of the following characteristics: (a) One or more breaks in the longitudinal continuity of the immersed surface, or an under body having more than one lifting surface. (b) An area of immersed transom exceeding 50 per cent. of the immersed midship section area taken at 50 per cent. of the load waterline. (Actual areas, with crew on board in racing position.)

## Yard & Shop

(Continued from page 48.)

### Bruns, Kimball's Own Show

Maintaining large stocks of new and used marine motors in both their New York and Philadelphia Show Rooms, Messrs. Bruns, Kimball & Co. are prepared for the spring rush of motor buying orders which are expected to materialize shortly. New model Sterlings, Kermath, Doman, and Gray Prior engines in the four-cycle line and Hartford and Arrow two-cycle motors are continually being received and a large stock of these motors together with sundries and parts for them are always available. An endless variety of used motors is kept on hand and a purchaser can find a motor to suit his taste or his pocket-book as he prefers.

(Continued on page 82)

Advertising Index will be found on page 208

## Sale by the Navy OF SUBMARINE CHASERS

Nos. 135, 136, 210, 211, 107, 216, 37, 44, 45, 47, 95, 178, 181, 182, 207, 272, 356, 436, 11, and 291

There will be sold by sealed proposals, receivable at the bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12:00 o'clock noon, 28 February, 1920:

SUB-CHASERS Nos. 135, 136, 210 and 211 now at the Navy Yard, Washington, D. C.

SUB-CHASERS Nos. 107 and 216 now in the First Naval District, Navy Yard, Boston, Mass.

SUB-CHASERS Nos. 37, 44, 45, 47, 95, 178, 181, 182, 207, 272, 356 and 436 now in the Third Naval District, Fleet Supply Base, 29th St. and 3d Ave., Brooklyn, N. Y.

SUB-CHASER No. 116 now in the Fifth Naval District, Naval Operating Base, Hampton Roads, Va.

SUB-CHASER No. 291 now in the Thirteenth Naval District, Navy Yard, Puget Sound, Wash.

Exact location may be ascertained from the Commandant of the district concerned, and should be obtained before making trip for inspection. Sales will be for cash to the highest bidders. \$25.00 deposit required with bid. Right to reject all bids reserved. Catalogs of Sale and full information concerning the vessels, and the terms of sale, obtainable from the bureau of Supplies and Accounts, or Commandants of the above districts. JOSEPHUS DANIELS, Secretary of the Navy. 1-16-20.

## Sale by the Navy Of DESTROYER, YACHT and GUNBOATS

There will be sold by sealed proposals, receivable at the bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12:00 o'clock noon, 21 February 1920:—

Destroyer HOPKINS, now in the Fourth Naval District, Navy Yard, Philadelphia, Pa.

Yacht AILEEN, now in the Third Naval District, Fleet Supply Base, Brooklyn, N. Y.

Gunboat ISLA DE LUZON, now in the First Naval District, Navy Yard, Boston, Mass.

Gunboat YANTIC, now in the Ninth Naval District, Naval Training Station, Great Lakes, Ill.

Exact location may be ascertained from the Commandant of the district concerned, and should be obtained before making trip for inspection. Sales will be for cash to the highest bidders. Right to reject all bids reserved. Catalogs of Sale and full information concerning the vessels, and the terms of sale, obtainable from the bureau of Supplies and Accounts, or Commandants of the above districts.

JOSEPHUS DANIELS  
Secretary of the Navy

1-12-20





*An Albany  
Express Cruiser*



*The Owner's luxurious  
cabin, looking aft*

## *Cruising Comfort*

If you will step aboard this cruiser and glide with us out upon the wind-dimpled surface of the water you will quickly appreciate the exhilaration and pleasure of boating and understand why an Albany is selected by yachtsmen who measure Comfort at its proper value.

**EXHILARATION**—because this Albany Cruiser is so buoyant, so speedy, so responsive to controls that it seems more a thing of life than inanimate wood and metal.

**PLEASURE**—because of its fine workmanship, its harmonious furnishings, and the quiet refinement that pervades throughout.

**COMFORT**—because of its generous spaces, its convenient arrangements, its rest-inducing easy chairs and sleeping quarters.

We mention just a few of the unusual advantages of this luxurious craft.

57 x 11 feet of Cruising Comfort.

Glass Enclosed Bridge Deck and Dining Saloon.

Owner's Cabin with extra Pullman Berths, toilet, bath, and other conveniences.

Guest Stateroom and Toilet. Deep lazy-backs swinging up to form extra berths.

Broad aft-deck. Accommodates six chairs.

Galley with three hole range and oven, big refrigerator and ample room for two to work in comfort.

Engine room, accessible, flooded with light, 7-foot headroom.

Power, twin 6-cylinder Motors.

Electric starting, lighting and controls.

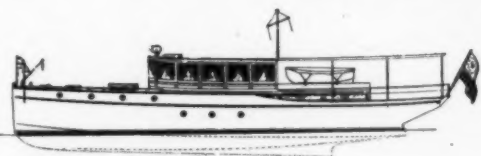
Sleeps and dines eight people and crew of two.

Fo'castle for crew forward.

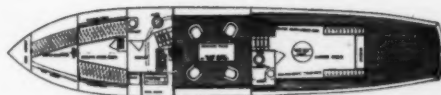
This Albany boat has some equally desirable little sisters; 36-, 40- and 50-foot Cruisers, 26-, 30-, and 35-foot Fast Mahogany Runabouts. A detailed description and pictures of the one that interests you will be forwarded on request.

### Albany Boat Corporation

*Albany*  
BOATS



7th Street  
Watervliet, N. Y.



*When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating*

## SALE BY THE NAVY OF Motorboats, Yachts and Barges

There will be sold by sealed proposals, receivable at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12 o'clock noon, 6 March, 1920:

Motorboat DAIQUIRI, S. P. 1285;  
Motorboat PATROL No. 6, S. P.  
54; Steam yacht PAWNEE, S. P.  
699; Steam yacht ACTUS, S. P.  
516; Coal barge BESSIE, S. P.  
1919; Motor patrol HUPA, S. P.  
650; Tug WINTHROP, S. P.  
3297; Steam yacht ADMIRAL  
II, S. P. 967, now in the First  
Naval District, Navy Yard, Bos-  
ton, Mass.

Motor yacht PARTHENIA, S. P.  
671; Steam yacht NAUSHON,  
S. P. 517; Steam yacht MARGA-  
RET, S. P. 527, now in Third  
Naval District, Fleet Supply  
Base, Brooklyn, N. Y.

Steam yacht VEGA, S. P. 734, now  
in the Fourth Naval District,  
Navy Yard, Philadelphia, Pa.;  
Tug FEARLESS, S. P. 724, now  
in the Fourth Naval District,  
Navy Yard, Philadelphia, Pa.

Motorboat NERITA, S. P. 3628;  
Motorboat SEA GULL, S. P. 223;  
Motorboat MAGGIE, S. P. 1202,  
now in the Fifth Naval District,  
Naval Operating Base, Hampton  
Roads, Va.

Motorboat RUSS, S. P. 1151; Mo-  
torboat HETMAN, S. P. 1150,  
now in the Seventh Naval Dis-  
trict, Naval Station, Key West,  
Fla.

Motor patrol boat WILROSE II,  
S. P. 195, now in the Sixth Naval  
District, Peoples Office Building,  
Charleston, S. C.

Steam yacht SISTER, S. P. 822,  
now in the Eighth Naval Dis-  
trict, Building No. 8, Naval Sta-  
tion, New Orleans, La.

Exact location may be ascertained from the Commandant of the district concerned, and should be obtained before making trip for inspection. Sales will be for cash to highest bidders. Ten per cent deposit required with bid. Right to reject all bids reserved. Catalogs of Sale and full information concerning the vessels, and the terms of sale, obtainable from the Bureau of Supplies and Accounts, or Commandants of the above districts. JOSEPHUS DANIELS, Secretary of the Navy, 1-26-20.

## RUNABOUTS

16, 22 and 25-Footers Standard Models  
Complete with Power and Equipment or Hulls  
built to order complete at very reasonable  
prices. Dinks, Power Tenders and Row Boats

BADGER MOTOR BOAT CO., Inc.  
Address, Lake Ave., Cor. 4th St., Racine, Wis.

## The Stanley Engine

Now owned and manufactured by  
Sutter Brothers

No. 44 Third Ave., N. Y. City

Agents for Fay & Bowen, Clay heavy duty,  
Fulton Engines

Joe's Reverse Gears, Wizard Magnetos,  
K. W. Coils

## BURGER BOATS

COMMERCIAL AND PLEASURE

If you plan to build a new boat this spring it will  
pay you to get our prices.  
We are prepared to furnish any boat up to 300 feet  
for all purposes and we guarantee satisfaction.

Write for information

BURGER BOAT CO.  
Manitowoc, Wisconsin

## TREGO MARINE ENGINES

Two cylinders. Bore 5" Stroke 6"

12 H. P. at 400 R. P. M. 15 H. P. at 500 R. P. M.  
20 H. P. at 600 R. P. M. 25 H. P. at 800 R. P. M.

Some excellent territory still open to reliable dealers

TREGO MOTORS CORPORATION  
Builders of the U. S. Liberty Engines  
New Haven Connecticut

## Starting Correctly to Build

(Continued from page 27)

and aft to tie the ends of the cut beams. A stout cleat is fastened each side and end under the floor beams and rails, on these the hatch sets. These by the way have a gutter cut to drain away any water that may leak through the joint.

The hatch is made with a frame all around of the same sized material as the cockpit floor beams. This is decked over with planking like that of the cockpit floor. After having been covered with canvas a lip of 1-16 inch thick by 2 inches wide brass is screwed along each side. This in addition to supplying a finish will prevent a lot of water from getting below.

Before closing for this month, I must make a note of the fact that in figure 55 in the December issue I should have explained more clearly that the two strips "A" and "B" should have extended beyond the point which marked the width of the deck, and to a distance an inch or two greater than half the width of the deck beam. In all likelihood most of you who are interested in amateur boat building caught this mistake at the time. As I was a professional boat builder for ten years I should not have let a slip like that get by and, also as I have been employed as a draftsman for a good many years I ought to be ashamed of myself, and I'm going to ask you good readers of *MoToR Boating* to look up the four English words which Benjamin Disraeli said were the hardest of all to pronounce.

As a concluding chapter to this series I have planned to show completed designs of a cruiser which, if small in dimensions; 20 feet by 7 feet will be very much of a boat. She will have good headroom, room for three to sleep, a single-cylinder motor, a speed of 7 miles an hour, a sailing rig which will propel her in an emergency, and several other distinctive and original features which all men who love boats admire—So look out for this little cruiser in the March number.

## Uses Buoy Below Ice Line

(Continued from page 34)

changing buoys. The chain is weighted so as to sink the keg practically awash. Then, after being frozen in, and the ice begins to move, the tapering upper end enables the keg to free itself; and it slips under the moving ice and remains submerged, only to bob up again when the ice has gone. This keg passed unharmed through the ice of 1917-1918, being beneath the ice for two months. It is not intended that this keg shall be used as a mooring; it merely acts as a float to locate the anchor chain when the regular buoy is again put out.

Another satisfactory float of this character is a timber about 6"x8", and eight feet long. An old railroad tie or a piece of condemned building timber will do. This should be tapered to a point at its upper end. If the chain does not sink the timber deep enough, it should be weighted at its lower end so it floats barely awash. This is essential for the safety of any buoy in the ice, for the higher it floats in the water, the more likely it is to be carried away when the ice moves.

If preferred, the regular buoy may be removed for the winter, and the anchor chain dropped to the bottom. In that case, first attach to the chain a piece of telegraph wire long enough to run ashore. Carry the wire ashore, and fasten to some secure post, burying the wire a few inches deep, if possible, where it crosses the shore line.

H. B. Washington, D. C.

Advertising Index will be found on page 208

## SALE BY THE NAVY OF TRANSPORTS

There will be sold by sealed proposals, receivable at the bureau of Supplies and Accounts, Navy Department, Washington, D. C., until 12:00 o'clock noon 21 February 1920:—

Transport YALE S. P. 1672,  
Transport CHARLES (ex-  
Harvard) S. P. 1298, now  
in the Fourth Naval District,  
Navy Yard, Philadelphia, Pa.

Exact location may be ascertained from the Commandant of the district concerned, and should be obtained before making trip for inspection. Sales will be for cash to the highest bidders. Ten per cent deposit required with bid. Right to reject all bids reserved. Catalogs of Sales and full information concerning the vessels, and the terms of sale, obtainable from the bureau of Supplies and Accounts, or Commandants of the above districts.

JOSEPHUS DANIELS  
Secretary of the Navy

1-9-20

## Sale by the Navy

of Tugs, Yachts, Motor Boats,  
Trawlers and Barges

There will be sold by sealed proposals, receivable at the bureau of Supplies and Accounts, Navy Department, Washington, D. C. until 12:00 o'clock noon, 21 February 1920:

Trawler EAST HAMPTON S. P. 573, Tug CHARLES MANN S. P. 522, PATROL No. 10 S. P. 85, now in the First Naval District, Navy Yard, Boston, Mass.

Tug DOROTHY CULLEN S. P. 2183, Yacht MARGARET S. P. 524, Converted Yacht MONTAUK S. P. 1213, Motor Patrol KATYDID S. P. 95, Yacht STURDY S. P. 82 now in the Third Naval District, Fleet Supply Base, 29th St. and 3rd Ave., Brooklyn, N. Y.

Barge YENRUT IV S. P. 3040 is now in the Fourth Naval District, Navy Yard, Philadelphia, Pa.

Motor boat HOPKINS S. P. 3254 is now in Fifth Naval District, Naval Operating Base, Hampton Roads, Va.

Motor boat LADY ANNE S. P. 154 is now in Sixth Naval District, Peoples Office Building, Charleston, S. C.

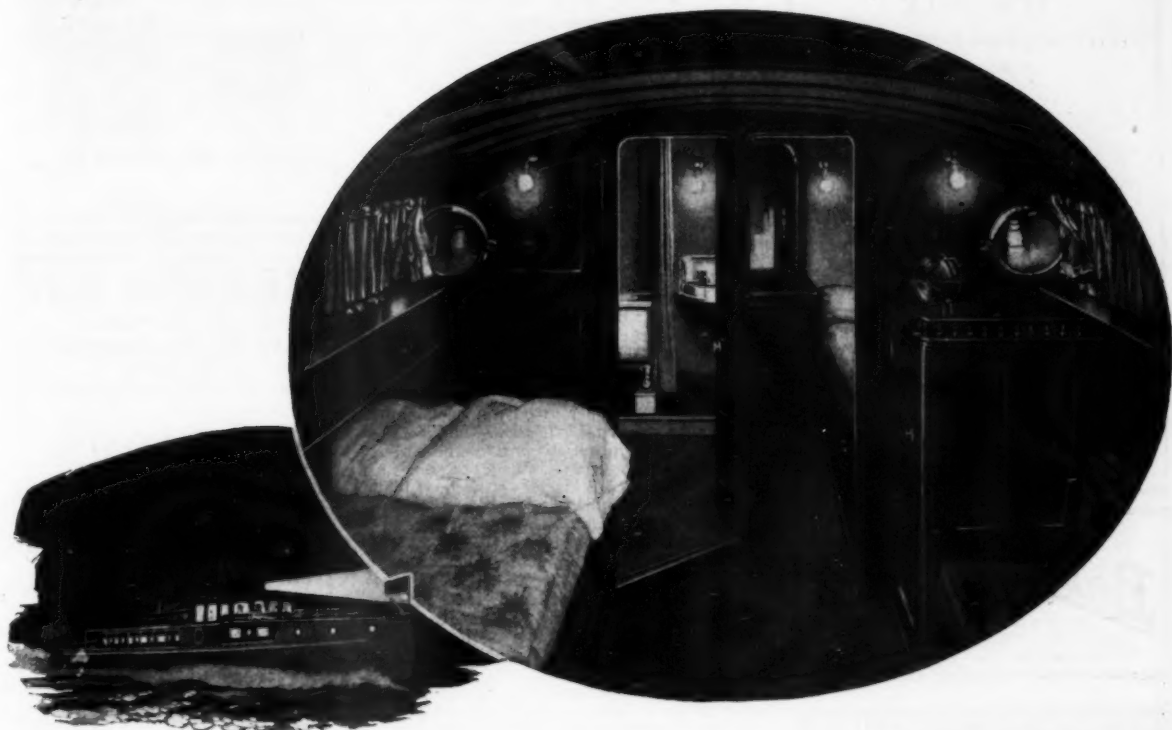
Patrol boat SATELLITE S. P. 1012 is now in Seventh Naval District, Naval Station, Key West, Fla.

Motor yacht VIRGINIA S. P. 274 is now in Ninth Naval District, Naval Training Station, Great Lakes, Ill.

Exact location may be ascertained from the Commandant of the district concerned, and should be obtained before making trip for inspection. Sales will be for cash to the highest bidders. Ten per cent deposit required with bid. Right to reject all bids reserved. Catalogs of sales and full information concerning the vessels, and the terms of sale, obtainable from the bureau of Supplies and Accounts, or Commandants of the above districts.

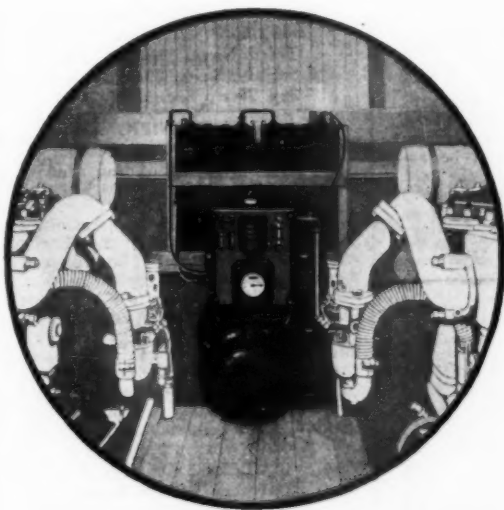
JOSEPHUS DANIELS,  
Secretary of the Navy

1-10-20



# DELCO-LIGHT

The pictures shown above are from photographs of the Emma Belle III, a Great Lakes Express Cruiser owned by Mr. Harry C. Stutz of Indianapolis. Delco-Light affords every electrical convenience.



**Y**OUR express cruiser, your house-boat or yacht, even your open launch, can enjoy a complete and *independent* electric light and power service with the Delco-Light Marine Set.

—plenty of current at all times on cruise or in port, whether the main engines are running or not.

—an abundance of light for cabin, staterooms, galley, engine room, bridge and deck (including regulation sailing lights and a powerful search light).

—power for fans, bilge pumps, and water systems (for bath and galley).

—heat for toasters, percolators and chafing dishes.

These are the services that the Delco-Light Marine Set offers for your boat.

See Delco-Light at the New York Motor Boat Show.

**DELCO-LIGHT COMPANY**  
DAYTON, OHIO



## FOR SALE

## U. S. Shipping Board Paints and Varnish

Toch Bros Camouflage Black,  
4 Bbls. ....@ \$2.00 Gal.  
Toch Bros. Battleship Grey,  
5 Bbls. ....@ 3.00 Gal.  
Louisville Marine Waterproof  
Varnish, 4 Bbls. ....@ 3.00 Gal.  
Woodfiller,  
1 Bbl. ....@ 1.25 Gal.  
Toch Bros. Dryer,  
1 Bbl. ....@ 1.50 Gal.  
Brown Shellac .....@ 2.75 Gal.  
Guaranteed as represented sold F. O. B.  
Warehouse, N. Y. City, N. Y.

OBERLE DISTRIBUTING COMPANY  
238 East 42nd Street, New York City

## SINCLAIR OILS

**Baldridge** Reverse  
You can get a Gear  
original all-enclosed, time-tested re-  
verse gear—now—for immediate delivery.  
Booklet "For the Man in the Boat," Free.  
THE BALDRIDGE GEAR CO. Boston, Mass.

**ANDERSON ENGINES**  
ARE GOOD ENGINES  
MADE IN CHICAGO, U. S. A.  
By The Anderson Engine Co.

## "WOLVERINE"

Heavy Duty Marine Engines.  
Kerosene-Gasoline-Alcohol Suction  
Producer Gas.  
**WOLVERINE MOTOR WORKS**  
Bridgeport, Conn., U. S. A.

**FREE!** Sonora Semi-Permanent  
Silvered Phonograph Need-  
les replace steel needles, play 50 to 100  
times, and are used on ALL MAKES of  
steel needle records. Economical, con-  
venient, improve tone, and preserve  
records. 25c per card of 5, 40c in  
Canada. Write today for FREE sample.  
**Sonora Phonograph Sales Co., Inc.**  
George E. Brightson, President  
279 B'way, Dept. 18, N. Y. Toronto, Ryrie Bldg.

**ATWATER  
KENT**  
AUTOMOTIVE EQUIPMENT  
Atwater Kent Mfg. Company, Philadelphia

**Masters**  
AUTOMOTIVE ACCESSORIES

**MASTERS MANUFACTURING CO.**  
7 WOOLSEY SQUARE, JAMAICA PLAIN, BOSTON, MASS.

## Yard and Shop

(Continued from page 48)

### A Bill to Reduce the War Tax on the Use of Motor Boats

As usual MoToR BoatinG is able to give its readers first information on the subject of taxes on motor boats. On February 3, Senator Calder of New York, introduced a bill in the Senate of the United States known as S.3904 which if passed will materially reduce the annual tax on the use of some motor boats, principally those of the smaller sizes.

The new bill provides that instead of the old tax rate of \$10. per year as a minimum for boats under 5 net tons; and over 5 net tons at the rate of \$1 or \$2 per foot depending on the length of the boat, that the annual tax hereafter shall be 50 cents per gross ton on boats of less than 16 gross tons and \$1 per gross ton on boats of over 16 gross tons burden.

The new bill provides as a method of determining the gross tonnage of one's boat that the overall length of the boat in feet shall be multiplied by the boat's beam and this product multiplied by the boat's depth using the height from the upper side of the plank sheer to the rabbet line. This product is to be multiplied by six-tenths and the result divided by 100 which will give the gross tonnage of the boat.

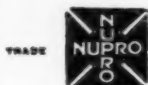
For example: A boat having a length of 30 feet, a beam of 9 feet and a depth of 6 feet would have a gross tonnage according to the above rule of 9.72. The annual tax rate on a boat of this size would, therefore, be \$4.86, whereas the present tax on such a boat would be \$10. This new bill, as will be seen, will materially reduce the tax on motor boats and should be supported by every motor boatman.

### Navy Department Offers to Sell Many of the 110's

During the war the Navy built over 455 sub chasers. Many of these will be sold. These are seagoing wooden vessels 110 feet long fitted with three Standard gasoline engines of 200 h.p. each. They have an auxiliary engine for generating electricity, air compressor, large bilge pumps, many with full heating equipment and some with radio. These boats will be sold at very low values in comparison with their original cost of from \$75,000 to \$80,000 each. The suggestions have been for purchasers to remove two of the engines, using the space occupied by the engines, the officer's quarters and the forward magazine for a midshiphold, which will be approximately 30 feet long. This conversion can be made at a reasonable figure and the purchaser will then have two spare engines either for sale, use in other boats or to be kept as spares. Plans have been discussed for converting them into fire boats, which can be accomplished for probably a fifth the cost of a new fire tug. Many yachtsmen have been interested in these vessels, as their worth has been well proven.

(Continued on page 84.)

INTRODUCED 1907



REGISTERED

NEW PROCESS CHEMICAL CO.  
38-41 Cortlandt St.

## NUPRO

## MARINE GLUE

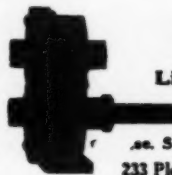
for deck seams and stop-  
ping leaks in boats. Elastic.  
Adhesive.  
NUPRO COPPER  
PAINTS are best for pro-  
tecting wood hulls from  
worms and growths.  
Shipchandlers: Write for  
prices.

New York City

WE CAN MAKE PROMPT DELIVERY OF  
NEARLY ALL SIZES OF THE FAMOUS  
**EMERSON** 2 CYCLE  
4 PORT

AT THE OLD PRICE

HERFURTH ENGINE & MACHINERY CO.  
Alexandria, Va.



## PUMPS

Made by the  
**Lipman Mfg. Co.**

for circulating purposes  
are the very best. Hun-  
dreds of Thousands in  
use. Send for Catalogue.

233 Pleasant St.

Beloit, Wis.

## INTEGRAL CAMSHAFTS

We make them for the leading builders of marine,  
airplane and automobile motors. We are Integral  
Camshaft Specialists, insuring the utmost in qual-  
ity of workmanship and materials, accuracy and  
uniformity.

Let us quote on your designs.

**MUSKEGON MOTOR SPECIALTIES CO.**  
Muskegon, Mich.

## Sale by the Navy

### Of YACHT and MOTOR BOAT

There will be sold by sealed pro-  
posals, receivable at the bureau of  
Supplies and Accounts, Navy De-  
partment, Washington, D. C., until  
12:00 o'clock noon, 21 February  
1920:—

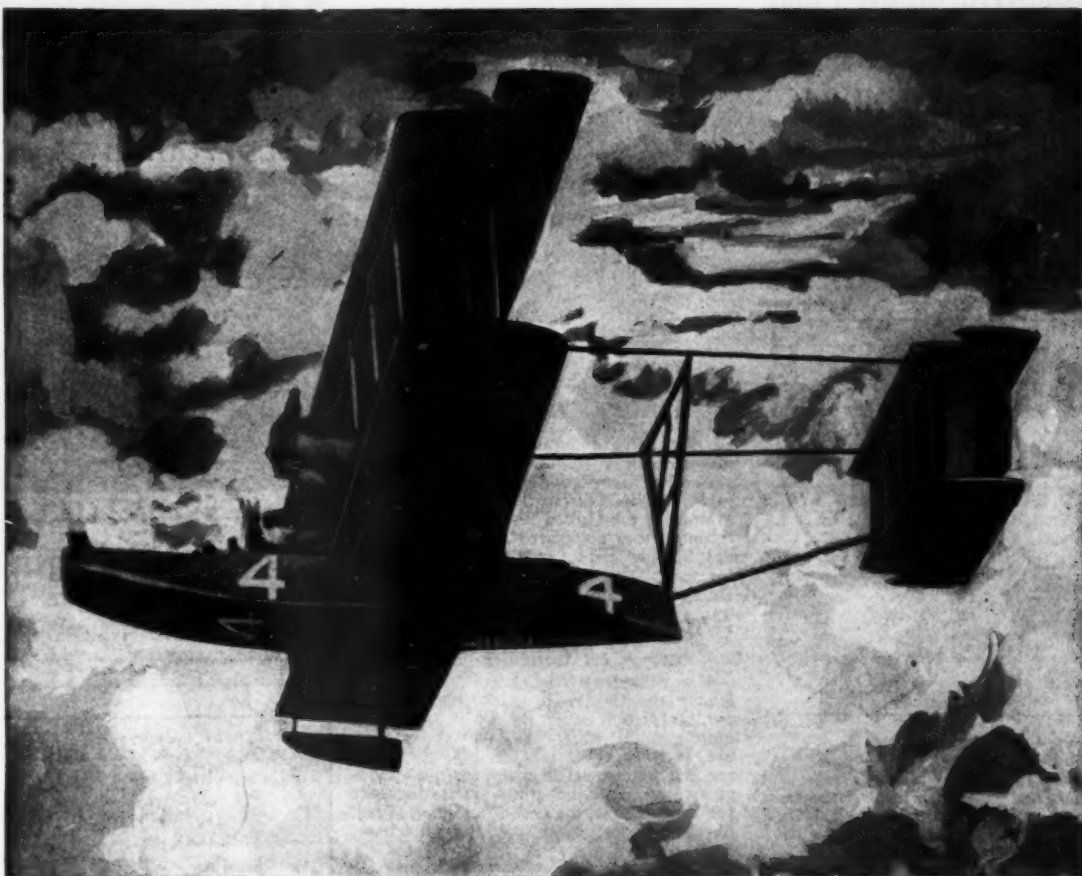
Yacht **HAUOLI** (ex-Califor-  
nia) S. P. 249, now in the  
Third Naval District, Fleet  
Supply Base, 29th St. and  
3rd Ave., Brooklyn, N. Y.

Motor boat **RAINIER**, now in  
the Twelfth Naval District,  
417 Sheldon Building, San  
Francisco, Calif.

Exact location may be ascertained  
from the Commandant of the district  
concerned, and should be obtained  
before making trip for inspection.  
Sales will be for cash to the highest  
bidders. Ten per cent deposit re-  
quired with bid. Right to reject all  
bids reserved. Catalogs of Sales and  
full information concerning the ves-  
sels, and the terms of sale, obtainable  
from the bureau of Supplies and  
Accounts, or Commandants of the  
above districts.

**JOSEPHUS DANIELS**  
Secretary of the Navy

1-13-20



**T**HE indorsement of GULF LIBERTY AERO OIL by the United States Navy in using it for the NC-4 flight should be conclusive proof of the efficiency of Gulf Products.

### SUPREME AUTO OIL

is manufactured from the same crude base—in the same refinery—under the same conditions—and gives the same efficient lubrication in boating motors.

## GULF REFINING COMPANY

General Sales Offices: PITTSBURGH, PA.



District Sales Offices:

NEW YORK  
ATLANTA

PHILADELPHIA  
NEW ORLEANS

BOSTON  
HOUSTON

### Keep your boat dry while at anchor AUTOMATIC BILGE PUMP

Motion of the boat works the pump  
Get Order In Early Introductory Price \$17.50  
A tireless worker at a troublesome job

ROCK-A-WAY PUMP CO.  
61 Gorham St. West Somerville, Mass.

**DREADNAUGHT SAFETY SUIT**  
for SAFETY, UTILITY and PLEASURE  
Great for Duckshooting and Fishing  
Kapok Swimming Belts and Canoe Cushions, \$2.25 each.  
Adjustable Kapok Jacket, \$12.00.

**SAFETY-AT-SEA CORPORATION**  
1358 Broadway New York

## POLARINE

The Standard Oil  
For All Motors

Standard Oil Co. of New York

A VOID disaster by using  
a DIRIGO compass on  
that boat. All materials  
first class. No rubber  
gaskets to rot. A very hard  
pivot and high-grade jewel.  
Navy degree circle on dial.  
Brass and mahogany bin-  
nacles. Also new course  
finder and bearings instru-  
ment. Send for descriptive  
catalog.



EUGENE M. SHERMAN  
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**Preservo**  
Trade Mark Registered  
Waterproofs and Preserves  
Canvas. ROBERTSON  
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357 Western Ave., Boston, Mass.  
THE HUNTER-JOHNSON CO., 209 California St., San Francisco, Cal.  
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**PURDY BOAT COMPANY**  
Designers and Builders of  
**EXPRESS CRUISERS**  
TRENTON, MICHIGAN

**MATTHEWS**  
FULL-AUTOMATIC  
Lighting and Power Plants  
Made in five sizes for Yachts, Boat-houses, Cottages,  
etc.  
Send for the big new Matthews Book.  
THE MATTHEWS ENGINEERING CO.  
425 Monroe St., Sandusky, Ohio



### Nautical Instruments

underlighted Compasses,  
Course Protractors, Bearing  
Finders. Every navigator  
should have them. Send for  
interesting catalogue. Ad-  
dress Box 45.

Marine Compass Company  
Bryantville, Mass.

### Forgings and Castings

for marine work a specialty. Our experience in this  
particular field is at your disposal. Get our estimate  
before specifying on aluminum, bronze and composi-  
tion castings, also drop forgings of steel and brass.

THE HARLEY COMPANY  
1065 Page Blvd. Springfield, Mass.

## Yard and Shop (Continued from page 82) A Southern Boat Building Yard

Due to the destruction of its engine building plant by fire some few years ago The Gibbs Gas Engine Co., of Jacksonville, Fla., have withdrawn from the manufacture of engines and devote their entire attention to boat building. Yachts, Houseboats, Cruisers, etc., and all types of commercial vessels come within their sphere. The plant is equipped with a floating dry dock of 1200 tons capacity and anything up to 250 feet in length can be readily accommodated. Four launching ways and over 40,000 sq. ft. of covered building space are available for new construction. A large stock of lumber of all kinds together with every variety of marine hardware items are constantly on hand.

Their policy is to use only the highest grade of materials and workmanship on all work turned out in their yards. The master builder has had thirty years experience in numerous yards. The expert yacht finishers do work which is second to none in the United States. There have recently been completed and delivered to the Florida East Coast Hotel Company for use at their Long Key fishing camp, six specially designed fishing cruisers.

### Popularity of Motor Boats in China

Motor boats are gaining in popularity among the Chinese, and the time seems not far distant when they will be in far more general use for business and pleasure. It is reported that at least 50 boats are being constructed in the various yards at Canton, and that there is a demand for motor boat engines developing from 15 to 35 horsepower. While American engines are popular, manufacturers should take into consideration that the Chinese give great weight to the price, rather than basing their purchases solely on quality, especially as European manufacturers undoubtedly will take advantage of this fact in their efforts to capture this growing market.

### A Boat-Building Yard

Messrs. B. R. Herman & Co. are about to erect at Karachi, India, a plant for the building of boats—motor boats, launches, etc. At present this concern is doing work of this character at a point inaccessible to tidewater and is materially handicapped in consequence. The new plant will be located on a water frontage, and in it will be installed all equipment necessary to the economical and expeditious conduct of the industry.

### Kerosene and Heat Might Help

(Continued from page 30)

If the flange will not pull off over the studs, these must be sawed through, inserting the saw between flanges and cutting through the gasket. Then punch out or drill out the studs left in the pipe flange and drill and tap for new studs as described above.

The pipe stub may generally be removed, without damaging the flange threads, as shown in Figures 4 and 5. Saw out a narrow strip from the pipe, then hammer or compress in a large vise at the point marked. This will curl up the pipe and draw it out from the flange threads and by working all the way around the whole stub can be removed, leaving the flange ready for the insertion of the new pipe.

H. H. P., OAKLAND, CAL.

Advertising Index will be found on page 208



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RADIATE SATISFACTION  
Free Models Write for Prices  
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Established 1892. Solely for the U.S. Navy  
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FOR MARINE SERVICE

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CORPORATION  
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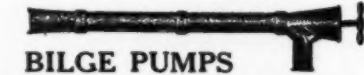


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You Can Build Your Own Boat  
and save 2/3 the cost by the BROOKS K. D. SYSTEM.  
Send for catalogue showing all models.  
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## Standardization Means Perfection

**D**ESIGNING a model, testing and perfecting it in every detail, *then* building that model in quantity—that is Standardization. Thus perfection and ELCO STANDARDIZATION are synonymous, for it was necessary to attain perfection before we would undertake to standardize.

The benefit of ELCO STANDARDIZATION is the benefit of years of experience in building boats of absolute seaworthiness and reliability—the final test of this standardization was the perfection of the service rendered by the 700 Submarine Chasers—the famous British “M.L.’s.”

Above is illustrated an example of what ELCO STANDARDIZATION has made possible—the perfected open hull and power equipment; with other illustrations showing how this open hull can be adapted for cruising or any other type of boat you may wish, without any changes whatsoever to the hull or the machinery.

STANDARDIZATION has so simplified boat building that we are able to construct boats in quantity with the absolute assurance that each and every one is a success—that all experimentation has been removed. In other words, the ELCO STANDARDIZED Boat incorporates everything that more than 25 years in the building of fine boats has taught us.

### ELCO STANDARDIZED MODELS

- 32 Ft. ELCO CRUISETTE  
Adaptable to any use
- 30 Ft. ELCO EXPRESS  
Speed 22 miles
- 36 Ft. ELCO EXPRESS  
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New four-cylinder Standard  
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Send for our brochure “Hounding the Hun from the Seas”

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### Automatic Extension Reel FOR ELECTRIC LAMPS

This fixture enables you to inspect your boat or engine at any distance from the reel. With this outfit installed in your boathouse or machine shop you can take your lamp with you to any part of the building—an automatic lock holds the lamp at any desired distance. The mechanism automatically rewinds the cord when you are through with the light. It is equipped with 25 ft. of reinforced cord, handle, socket and lamp guard. Write today for prices.

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Raven Brand Flags will be displayed on the taffrail staff of the "International 32."

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### Improved Motor Boat Closet

Figure 1404

Dimensions: 18 x 18 x 11" high to top of bowl; 2 1/4" cylinder. For above or below water line.

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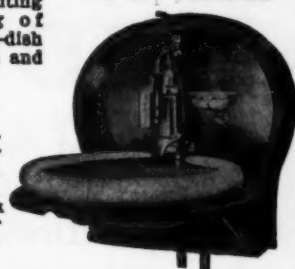
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### With Pump

Cock on pump swings upward, thus preventing breaking of bowl. Soap-dish is porcelain and removable.

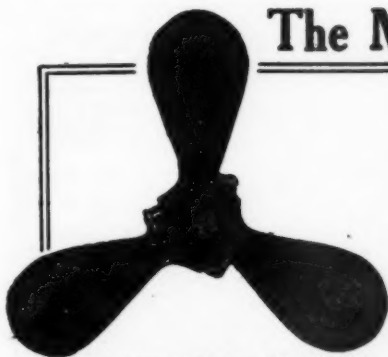
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Height, 19 in.  
Width, 19 in.  
Depth Closed, 6 inches.  
Quartered Oak Case, or Mahogany Case.

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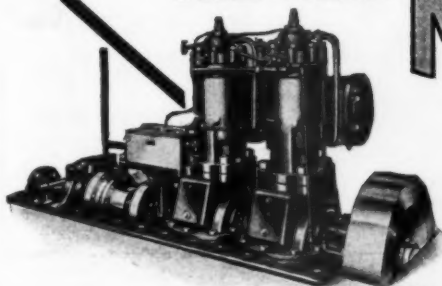
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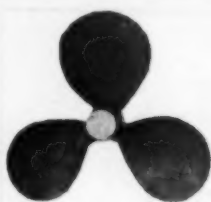
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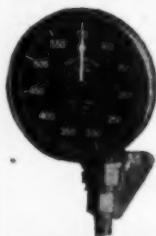
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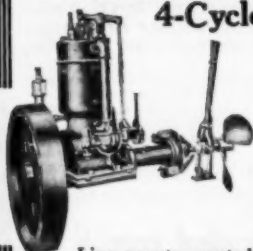
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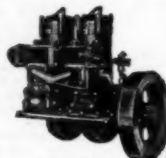
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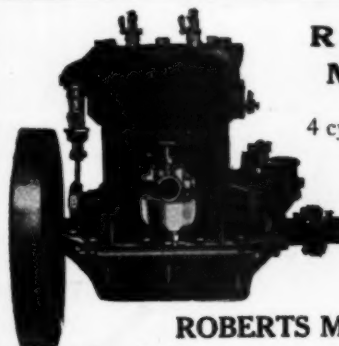


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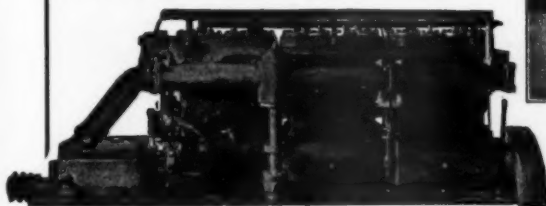
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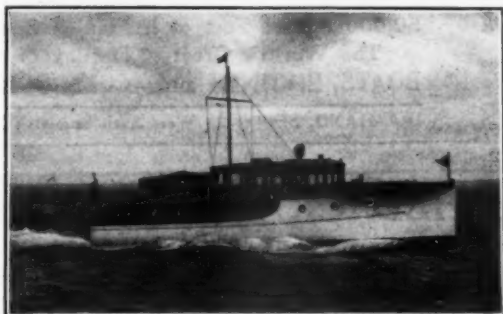
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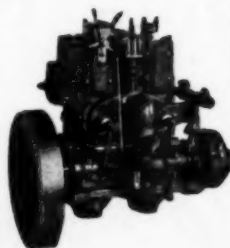
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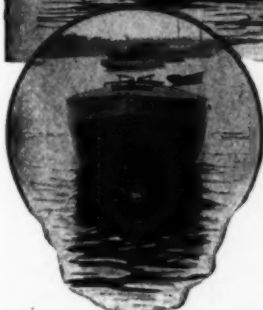
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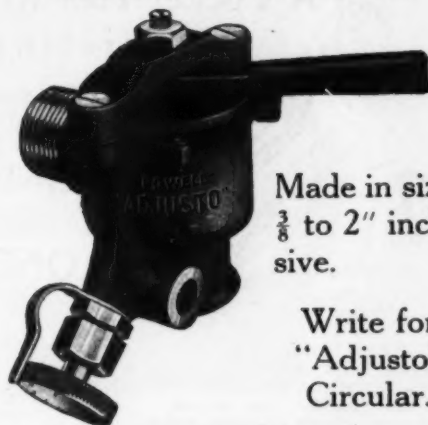
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From 'Hook-to-Hook' a line of Steel.



**Steel Safety Hook and Crosshead.** Both are steel forgings designed to swivel and rock.

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Makers of the Yale Locks  
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The RONSON combines eight standard open end wrenches, screw driver, bottle opener and alligator jaw in one compact unit. Made of tough, tempered steel, highly nicked. Weighs only eight ounces—fits the pocket. Get one from your dealer today.

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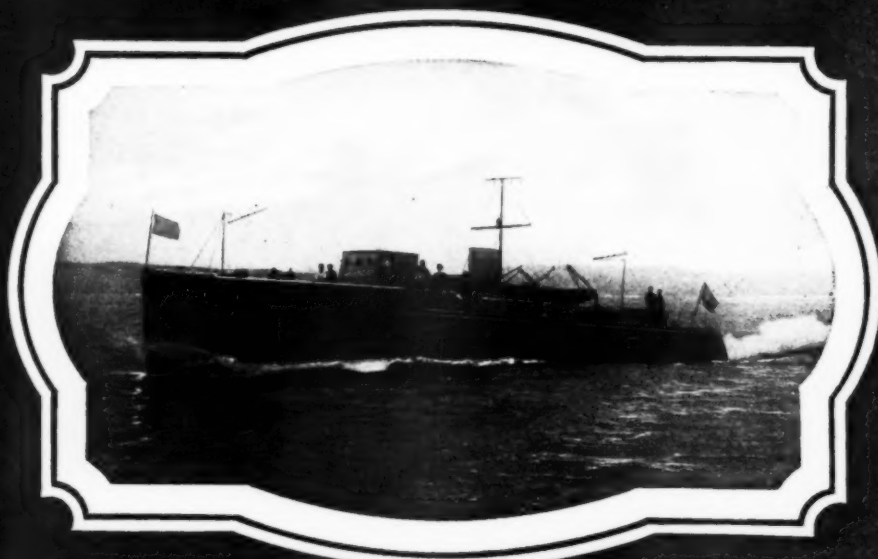
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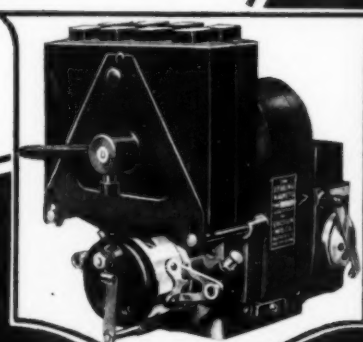
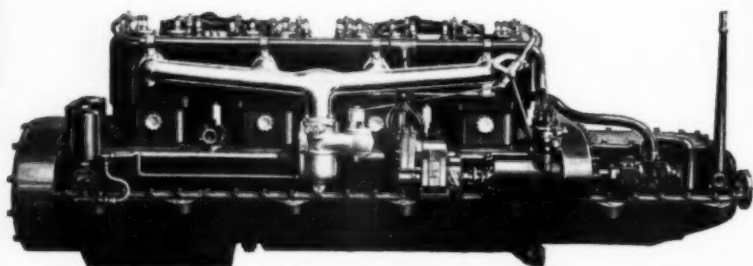


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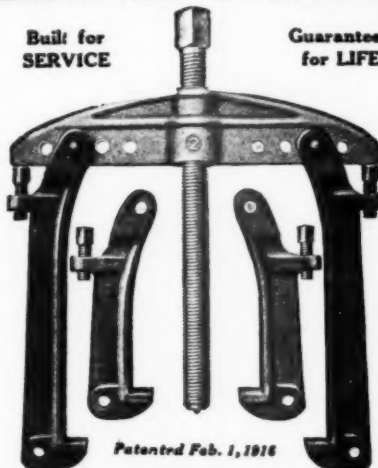
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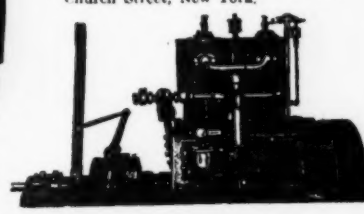
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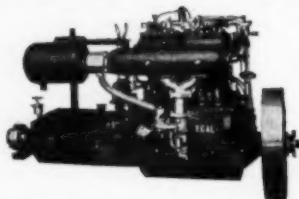
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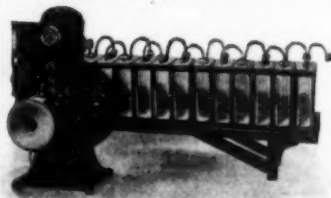
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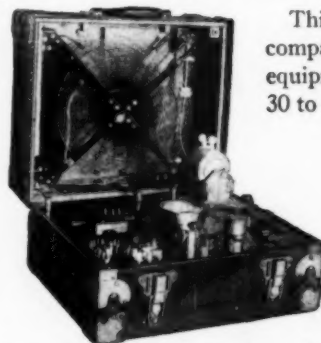


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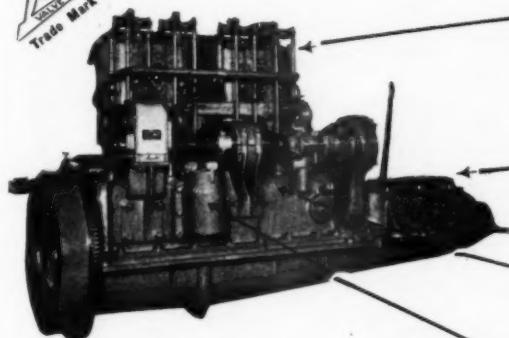
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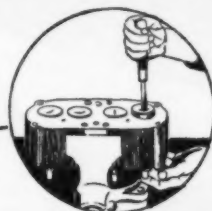
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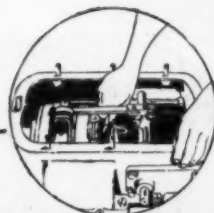
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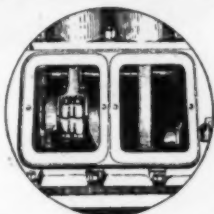
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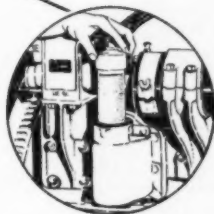
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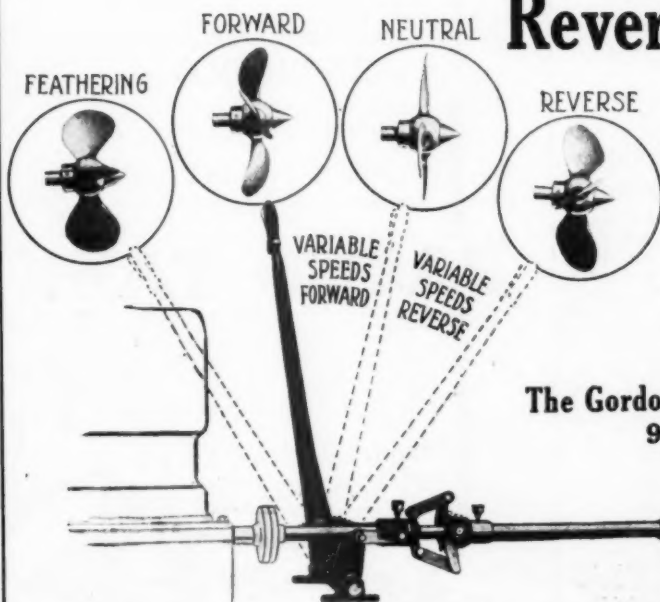


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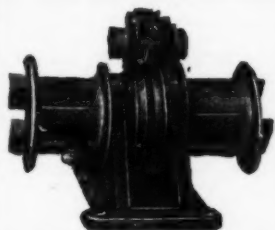
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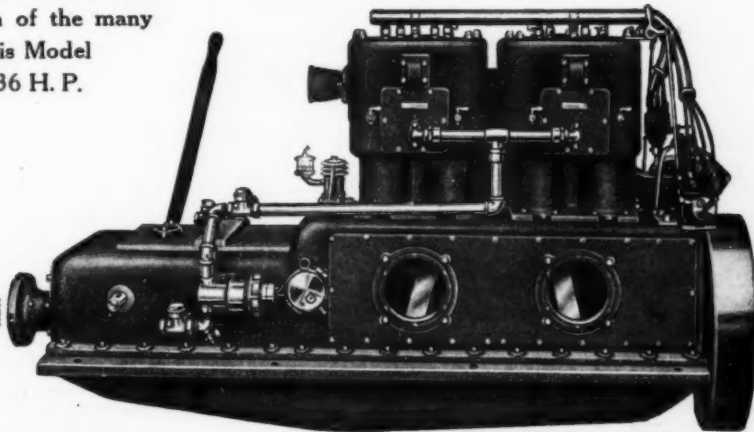
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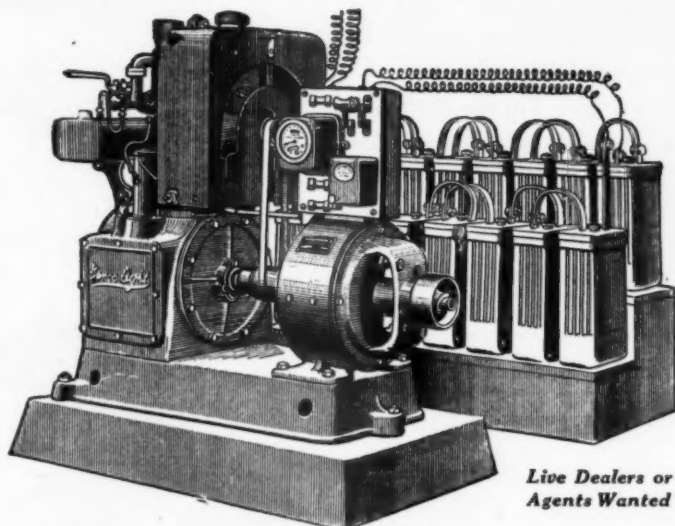
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**119 West 40th Street, New York**

Advertising Index will be found on page 208



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*What "Moreton Guaranteed"  
on rebuilt engines means to  
you—*

¶ Engines that are taken in trade on new motors only, not for speculation. ¶ That are thoroughly rebuilt by skilled mechanics in our own shop. ¶ That are unsparingly furnished with new parts. ¶ That are rigidly inspected and tested. ¶ That finally reach you in perfect running order.

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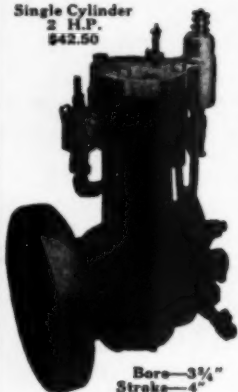
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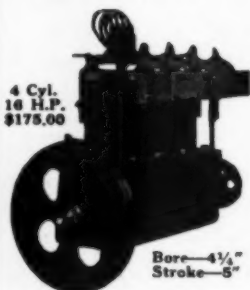
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Single Cylinder  
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\$42.50



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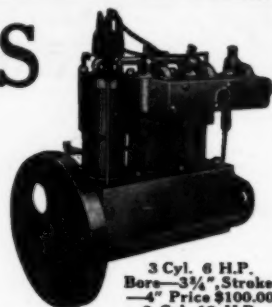
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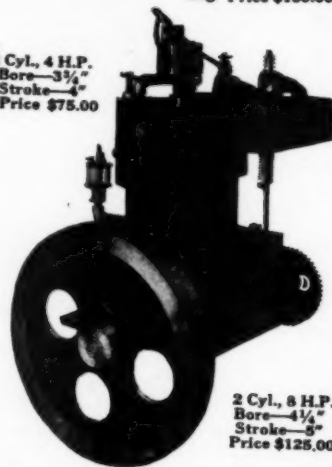
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NEW YORK, U. S. A.

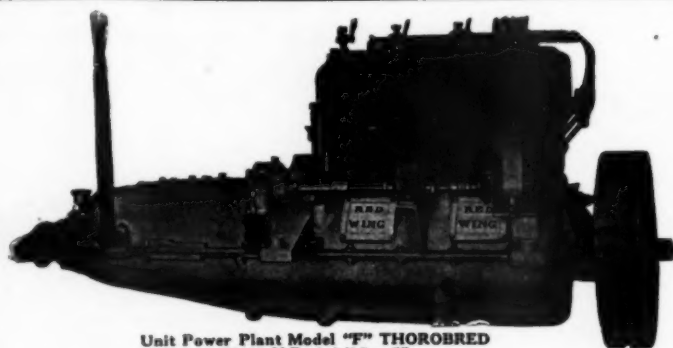


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Bore—4 1/4" Stroke—5"  
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Unit Power Plant Model "F" THOROBRED  
28-36 H.P. 4 1/16 x 5"  
Furnished with or without Unit Power Plant

**Red Wing Thorobred**  
THE MOTOR WITH POWER TO SPARE

## Order Yours Early

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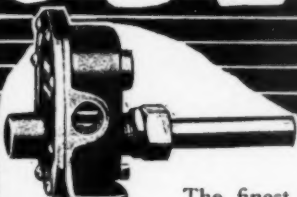
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If you are figuring on a new power plant for 1920 we urge you to get into communication with us now, while we can guarantee deliveries. It will save disappointment later.

**Five Models, 10 to 40 H. P., for every service.**  
**They burn either Gasoline or Kerosene.**

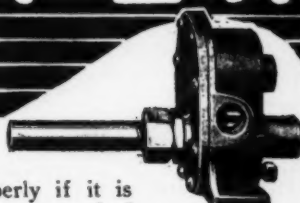
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# OBERDORFER PUMPS



**TYPE-A  
FORM-Y**

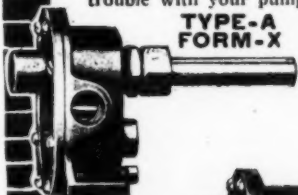
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**TYPE-C  
FORM-Y**

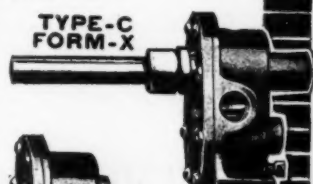
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are built especially for marine use—they are made to withstand the hard service encountered in use on board boat—Oberdorfer Bronze Geared Pumps are noiseless, automatic, compact and reliable. The supply of water, fuel or oil is governed entirely by the motor—there is never an over or under supply. If you have ever had trouble with your pump you will find a world of satisfaction in the trouble-proof Oberdorfer.



**TYPE-A  
FORM-X**

If you own a boat powered with an internal combustion engine you will be interested in our new book on pumps. Your copy is ready for you—it comes free on your request.

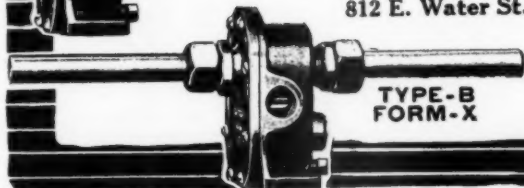


**TYPE-C  
FORM-X**

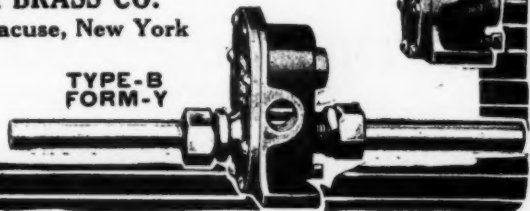
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Syracuse, New York



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Much-Talked-of Performances  
OF THE

# TALBOT STEAM UNIT

It is **EFFICIENT** because it is a single, self-contained unit within which both high temperatures and high pressures are produced and safely maintained. Engineers are agreed such an apparatus assures maximum efficiency.

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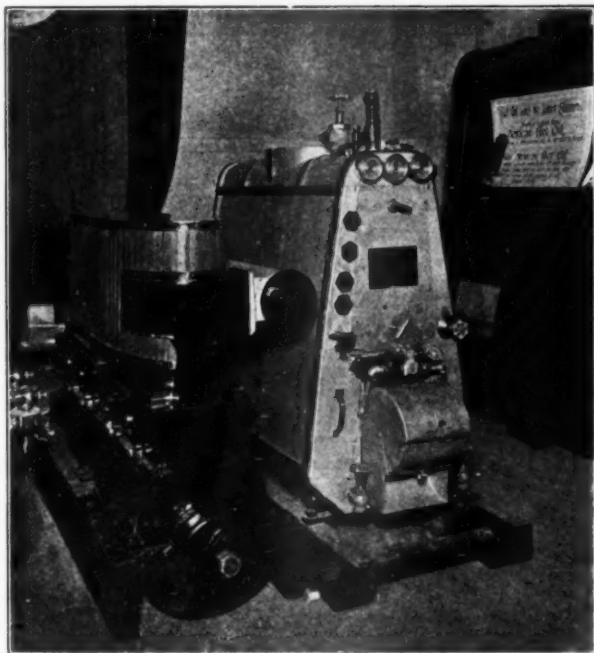
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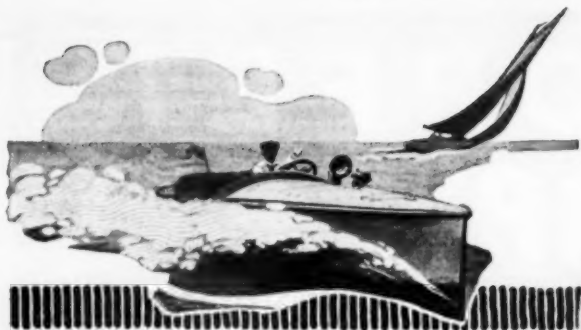
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Factories—PLATTSBURGH, N. Y.  
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66 BROADWAY, NEW YORK CITY

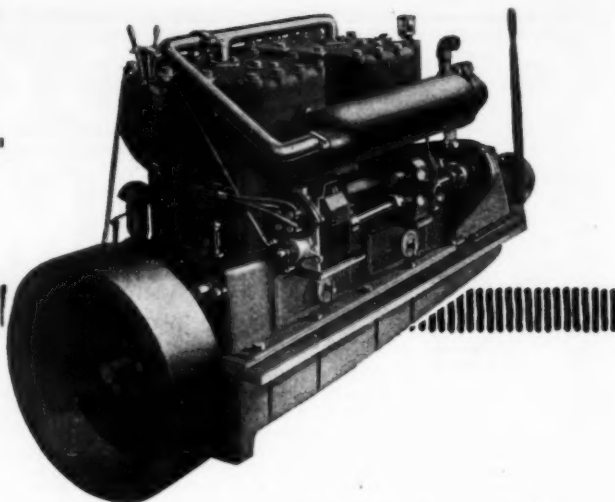
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Run your Doman-engined boat with kerosene and save the cost of high-priced gasoline. The Holley-Doman carburetion system is entirely different from a "hot



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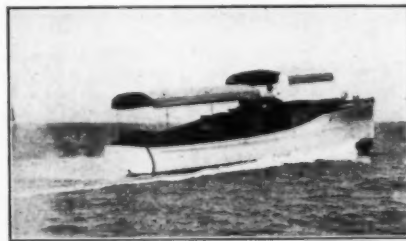
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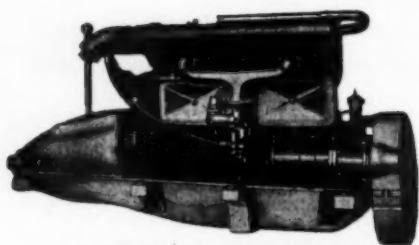
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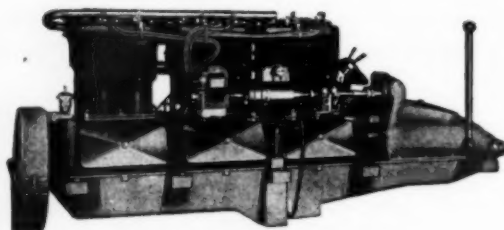


*"The Motor That Crossed the Atlantic"*

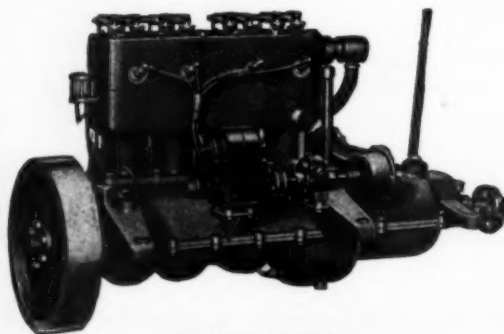
**"COST** is measured by  
**RESULTS OBTAINED** and in no other way."



**New Model D-4 Four-Cylinder**  
High Speed 40-50 Horse Power  
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High Speed 60-75 Horse Power  
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**"Scripps Special"**  
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**W**AR taught prudence in buying. True economy prescribes purchase on performance rather than price, for maintenance, operating expense and dependability are the real vital factors today, whether you buy for pleasure or commercial boat.

And experience proves that a SCRIPPS motor delivers the greatest measure of real motor enjoyment, satisfaction, service and value at the lowest cost.

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**"Every Moving Part Enclosed"**



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# MARINE GLUE

**Is your boat watertight?**

If not a timely application of Jeffery's Marine Glue will remedy these defects, and insure a worry-proof season insofar as these details are concerned.

It is not sufficient to use mere glue. You must use the best—**Jeffery's Waterproof Glue**—the choice of knowing boatmen the world over.

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For Deck and Hull Seams of Yachts and Motor Boats

**USE—No. 1, Extra Quality** Black, white, yellow or mahogany color. Give black the preference; it is more elastic and satisfactory in every way.

Specified by all first-class designers, and used exclusively by all the prominent builders.

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For waterproofing canvas for covering Decks, Tops of Cabins, Steel or Wood Boats, Canoes and Seaplanes. It not only waterproofs and preserves the canvas but attaches it to the wood and with a coat of paint once a year will last as long as the boat.

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It is ready for use and requires no heating; simply open the can and paint it on, like ready-mixed paint.

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Our 35c emergency cans made a big hit. Every canoeist should carry one; it is as valuable to him as a repair kit to a bicyclist or an automobilist.

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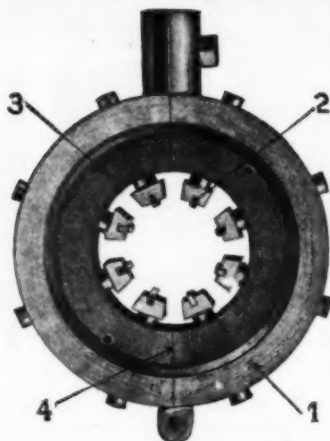
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(Patented)

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4. Tool split and hinged for placement on crank-shaft.

Will true egg-shaped crank pins without removing crankshaft from motor.

Peters' Crankshaft Grinder eliminates re-babbiting of bushings because of its sensitive adjustment.



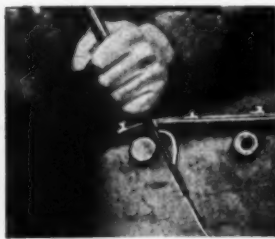
LIST PRICE, \$75.00  
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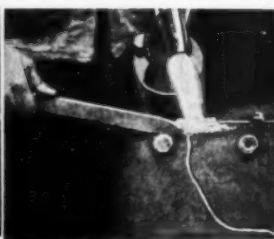
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(Nicro Spelter)

For Repairing Cracked Iron, Steel, Brass and Bronze Castings



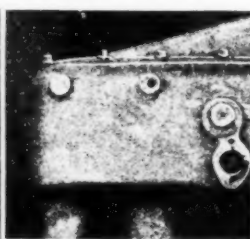
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Allow to cool for five minutes, dress off with a file, and the job is done

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FORMS A PERMANENT, WEAR RESISTING BRAZE

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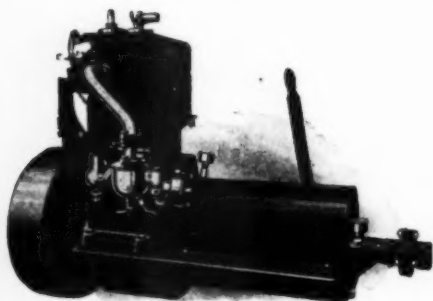
The Bissell Varnish Co., *Successor*



# MILLER

## Marine Distillate Engines

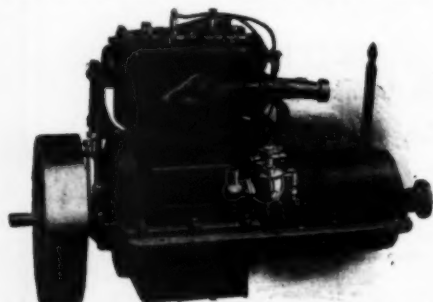
### For An Honest Motor Buy A Miller



A Single Cylinder Miller Unit Power Plant  
4 and 6 H.P.

### Kerosene or Gasoline Fuel

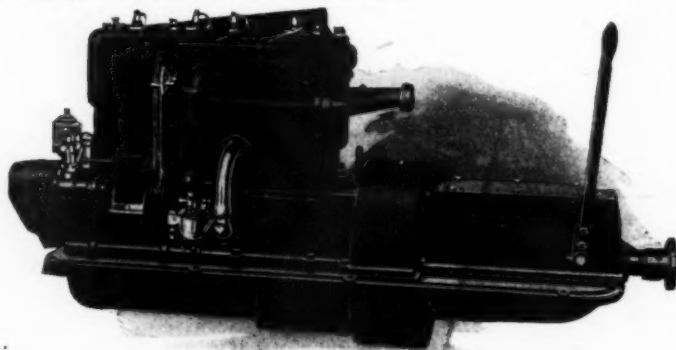
Miller Motors will burn either kerosene or gasoline with equal efficiency. This makes a big difference to the man who requires the most for his money, whether he owns a work boat or maintains it for pleasure only. With gasoline getting scarcer, higher in price and poorer in quality each season, it is a wise buyer who chooses a motor that will operate satisfactorily on kerosene or on gasoline, whichever he finds it more practical to use. With a Miller you are ready for anything, anywhere.



Two cylinder Miller engines are supplied in 10 and 14 H.P. models.

If you want a medium duty or heavy duty power plant that is backed by many years of successful service, get a Miller Motor. There are more expensive engines and more widely advertised engines, but there isn't a better built one. We have always striven for quality, not quantity, of output.

Miller Motors have been manufactured for nearly twenty years. There are hundreds in use. They have reached to every part of the world. They are giving satisfactory service in all sizes and types of boats, in both pleasure and commercial use.



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### For Every Size and Type Boat

There are ten Miller models, four cycle, medium and heavy duty types, from 4 H.P. to 50 H.P. Here you will find the kind of a motor you want, at the price you want to pay, whether you have a small boat or a heavy cruiser or work boat.

*Write today for latest catalog and prices.*

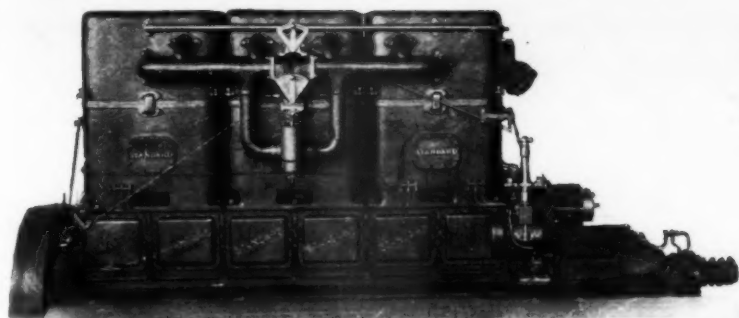
### MILLER ENGINE CO.

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## The New Type Standard Engine

Another World's masterpiece is created.

Intensified pleasure is opened to you; that additional *last mile*, without sacrifices.

This new triumph is a constant full load engine turning 550 to 600 R.P.M. It is the engine crystalized by War's work, where War's demands were *your* demands magnified *infinitely*. It is fundamentally an engine of time-proven STANDARD design with new developments incorporated which make possible the first complete accomplishment of maintained engine speeds up to 600 R.P.M., under endless, constant, full-load service.

In this engine the heretofore theoretically perfect cylindrical combustion chamber with valves in the head is a practical fact.

Friction of inlet and exhaust gases is all but eliminated.

Heat radiation through manifold walls, cylinder and heads is all but nil.

Phenomenal horsepower for bore and stroke is generated in the engine and delivered to the shaft with perfectly even turning movement.

*All* the features so wished for in the really high speed cruiser are realized together; safety, power, speed, economy, noiselessness, cleanliness.

Demands for this new type engine are ahead of production.

Write us your boat conditions for recommendations on maximum power.

Back of the STANDARD guarantee is the

STANDARD MOTOR CONSTRUCTION COMPANY

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## The New Type Standard Engined Victory Boats

**I**N 1910 The Elco Company got out a standardized stock 50' Cruiser. War's lessons intensified their consistent work of refining and developing this boat and equipment. Immediately after the War a systematic series of tests were made to get that *last mile* more speed. An engine of one make was installed in the boat, and trial runs were made and complete data recorded. That engine was then taken out and another make installed, in the same hull, when the same tests were made again, and so on. In this way an additional *knot* was discovered, with the new type 50 HP STANDARD Engine. More than a statute mile boat-speed was realized without sacrifice of space or weight, and with added safety, comfort and economy. The new type STANDARD engine is now standard equipment for maximum power in this stock boat.



A good many years ago The Mathis Company originated their now well-known Semi-House Boat type in which they have specialized so successfully and standardized into a stock boat. Their's has been a consistent, persistent development of an idea meriting success.

Many engines were tried during the years of evolution, but for some time their standardized equipment has included the Standard Engine.

And now with an 80' x 18' x 2' 9" boat, and two new type 70 HP Standards, the remarkable cruising speed (House Boat) of almost fourteen miles per hour is realized.

The new type STANDARD Engine is now standard equipment, for maximum power with limited draught, in this stock boat.

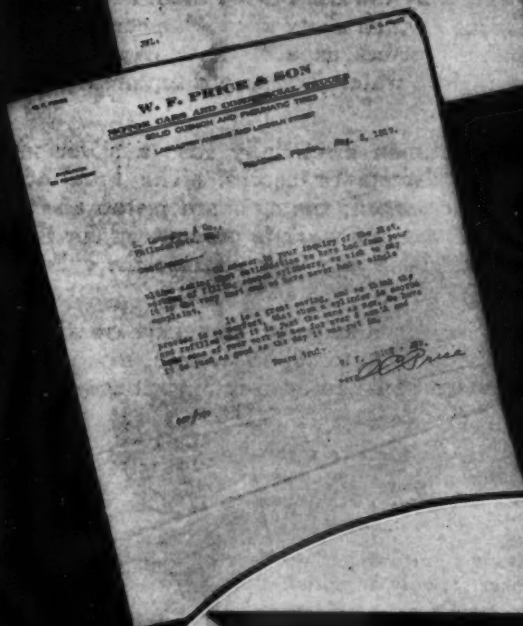
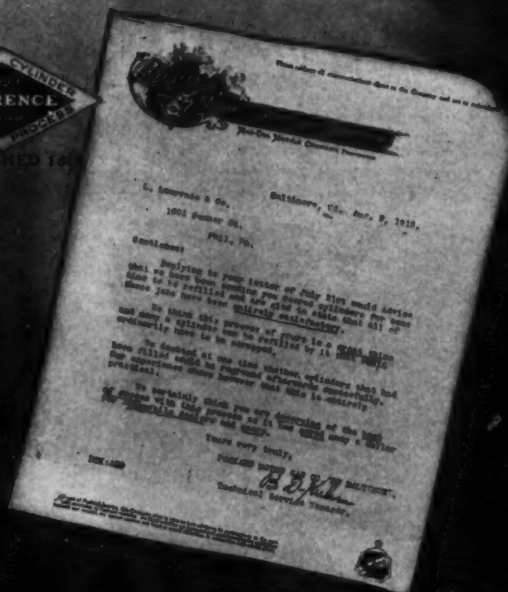
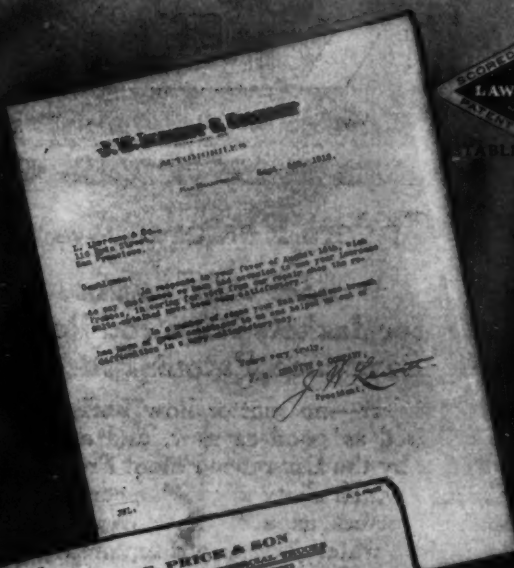
Back of the STANDARD guarantee is the

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# SUCCESS



The story of the Lawrence Patent Process for restoring scored cylinders without re-grinding—the story of its success and of its acceptance by automotive engineers, repairmen and owners.

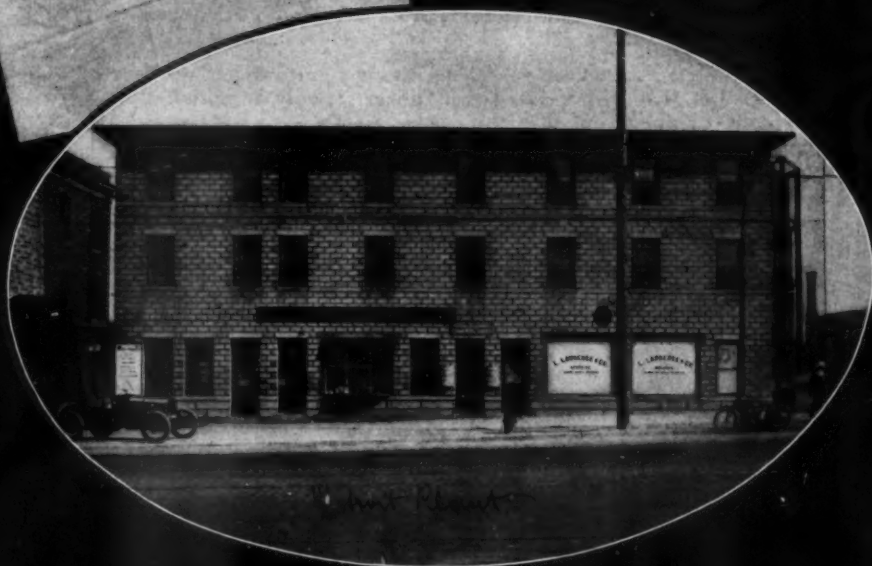
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Patents owned and licensed exclusively by

**L. LAWRENCE & CO.**

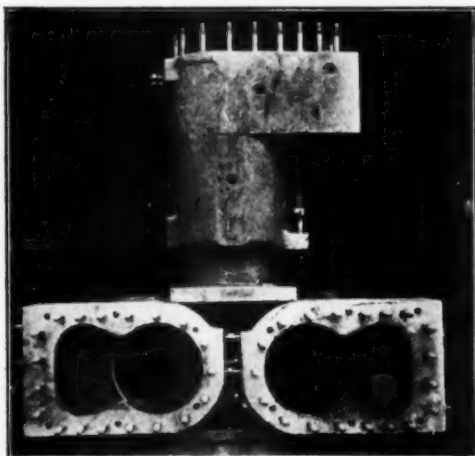
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# SCORED



## Scored Cylinders Restored Without Regrinding

### Cracked Water Jackets Repaired Perfectly by the Lawrence Patent Process

**S**CORED cylinders—no matter how badly scored—can be repaired as good as new, and at comparatively small cost, by the Lawrence Patent Process. New cylinder castings which show slight defects in the bore can be made as perfect as a flawless casting by this process. Cracked water jackets are repaired perfectly and permanently.

Our expert workmen electrically fuse a silver nickel alloy into the defects or scores. The bore of the cylinder is not enlarged; the standard piston and rings

fit the same as when new. The compression is restored and our work is **guaranteed for the life of the motor**. Positively cannot warp or harm the cylinders in any way because the cylinder is not heated.

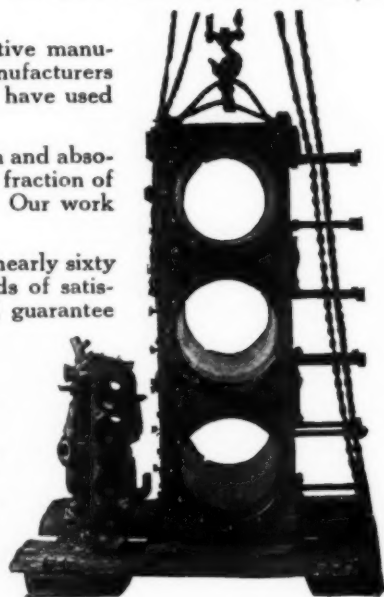
We have repaired scored cylinders for some of the largest and most expensive marine and industrial engines in use today, as well as for hundreds of automobile motors, saving thousands of dollars for our customers. Several high-grade motor and auto manufacturers are our regular patrons. We also do electric welding.

The Lawrence Process has been used and approved by leading automotive manufacturers, engineers and repairmen, government inspectors and manufacturers in many lines. Our strongest recommendations come from those who have used our work for many years and on many jobs.

Repairs by the Lawrence Patent Process are quick, inexpensive, uniform and absolutely permanent. Our plants give 24-hour service. The cost is only a fraction of the cost of replacing parts, or about one-fifth the cost of regrinding. Our work is guaranteed to outlast the motor on which it is used.

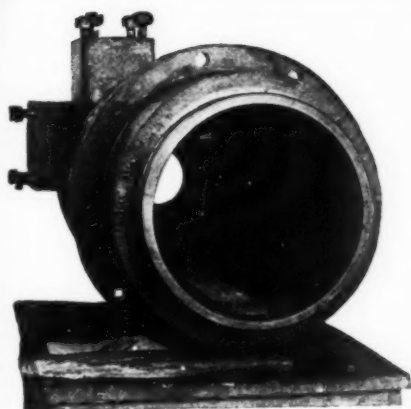
You are absolutely safe in entrusting your work to us. Our record of nearly sixty years in business, our thousands of satisfied customers and our broad guarantee backed by a strong company, is your protection.

Write today to our home office at Newark, N. J., for full particulars and quotations on your work, stating size of cylinder and defect. Or ship your cylinder to us at once. See list of Service Stations on second page following.



# L. LAWRENCE & CO.

# CYLINDERS



## Licenses under the Lawrence Process *Infringers Prosecuted*

**L**ICENSES and equipment under the Lawrence Patent Process are available for motor repair shops, motor manufacturers, etc. Liberal terms are offered which makes this department a money earner for any repair man, and a money saver for any manufacturer. Our national publicity creates customers for the licensee. Your own operators are trained to perform the work by skilled instructors at the Lawrence branches.

Many manufacturers have found that a license under the Lawrence Patent Process enables them to turn out a more perfect product, to remedy defects and to save many castings otherwise scrapped. It is a measure of conservation and economy which

cuts costs, increases production and reduces the scrap heap.

The Lawrence Process is covered by broad patents in the United States, Canada, England, France, Italy and other countries. These patents have been upheld by the courts in every infringement suit. Leonard Lorentowicz will continue to prosecute infringers to the full extent of the law.



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The Rebco oil-tempered steel spring expander indefinitely maintains an equal, just correct cylinder wall pressure with actually less pressure than the ordinary plain snap ring, thereby causing less wear to the cylinder wall.

Rebco is easy to install.

Rebco is ultimately economical in the saving of lubricating oil and fuel, and in the reduction of carbon deposits.

Install one or two Rebco Rings on each piston while your motor is down and see the instantaneous response to a new-born power.

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## Service Plants of L. LAWRENCE & CO.



### Investigate the Lawrence Patent Process

**T**HE Lawrence Patent Process will bear the closest investigation. We invite you to question our customers, and to visit our nearest plant and inspect some of our work. We are glad to have you subject it to any fair test. Every year some new applications of the Lawrence Process are discovered in various manufacturing fields. Perhaps we can solve a problem that has been troubling you. Put it up to our experts.

Read the explanation of the Lawrence Patent Process on the preceding pages. If you have a scored or defective cylinder or cracked water jacket, write to us or send it to any of our 71 service plants and licensees. If interested in procuring license under this patent write to our nearest Service Plant.

#### Lawrence Service Plants and Instruction Stations

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Buffalo—10 Summer St.  
Chicago—1522 Michigan Ave.  
Cleveland—6529 Euclid Ave.  
Detroit—85 Meldrum Ave.

Los Angeles—1030 S. Grand Ave.  
Milwaukee—18 Martin St.  
Minneapolis—14 N. 9th St.  
Newark—292 Halsey St.

New York City—355 W. 57th St.  
Philadelphia—1601 Summer St.  
Pittsburgh—5102 Baum Blvd.  
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Augusta, Ga.—Southern Welding Co., 927 Ellis St.  
Bay City, Mich.—L. D. Sheets, 506 E. John St.  
Bloomington, Ill.—Keiser-Vanleer Co., 211 E. Market St.  
Birmingham, Ala.—W. T. Sanborn Co., 10th Ave.-19th St. North.  
Bridgeport, Conn.—United Welding & Repair Co., 172 Elm St.  
Brockton, Mass.—Cushing Bros., 29 Chestnut St., E.  
Bronx, New York City—Victor Iron Works.  
Cedar Rapids, Iowa—Otto J. Jirsa, 1328 L St.  
Columbus, Ohio—Central Ohio Welding Co., 200 East Lynn St.  
Des Moines, Iowa—Bernhard & Turner Auto Co.  
Charlotte, N. C.—U. A. Rutledge.  
Denver, Colo.—Blanchette Welding Co., 149 South Broadway.  
Erie, Pa.—Lake Erie Welding & Spring Co., 338 W. 12th St.  
Eustis, Fla.—M. Hopson.  
Evansville, Ind.—Lindenschmidt Co., Ingle St.—1st to 2nd Aves.  
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Grand Rapids, Mich.—Ox-Welding Company, 75 Sheldon Ave.  
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Hartford, Conn.—Charter Oak Machine Co., 438 Asylum St.  
Hudson, N. Y.—Hudson Welding & Repair Wks., 22 Spring St.  
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Windsor, Canada—L. Lawrence & Co., 41 Sandwich St., W.  
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Melbourne, Australia—A. Finlay Bros., 322 Elizabeth St.

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ESTABLISHED 1862

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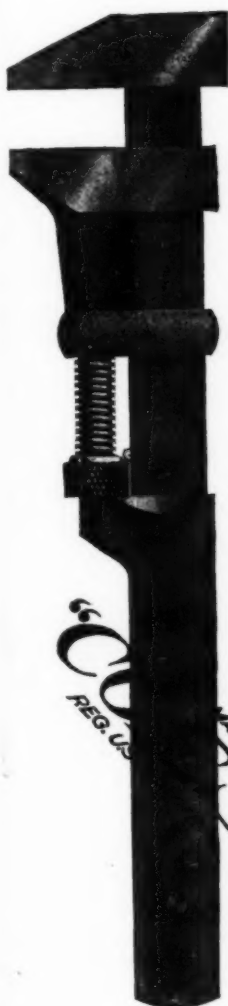
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Advertising Index will be found on page 208

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make good with works.*

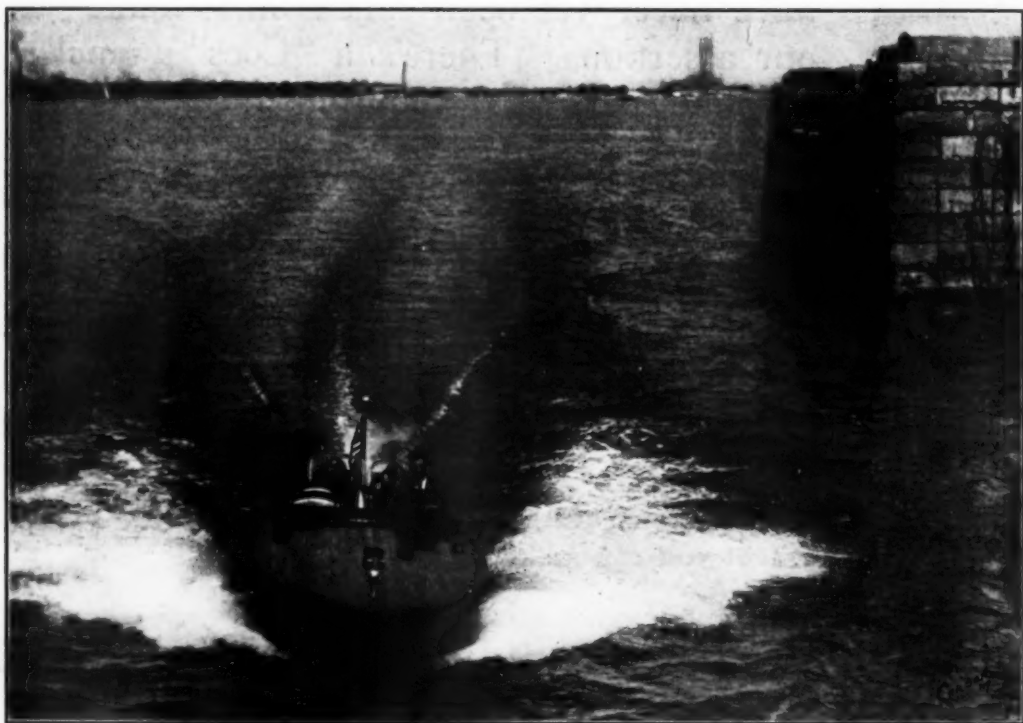
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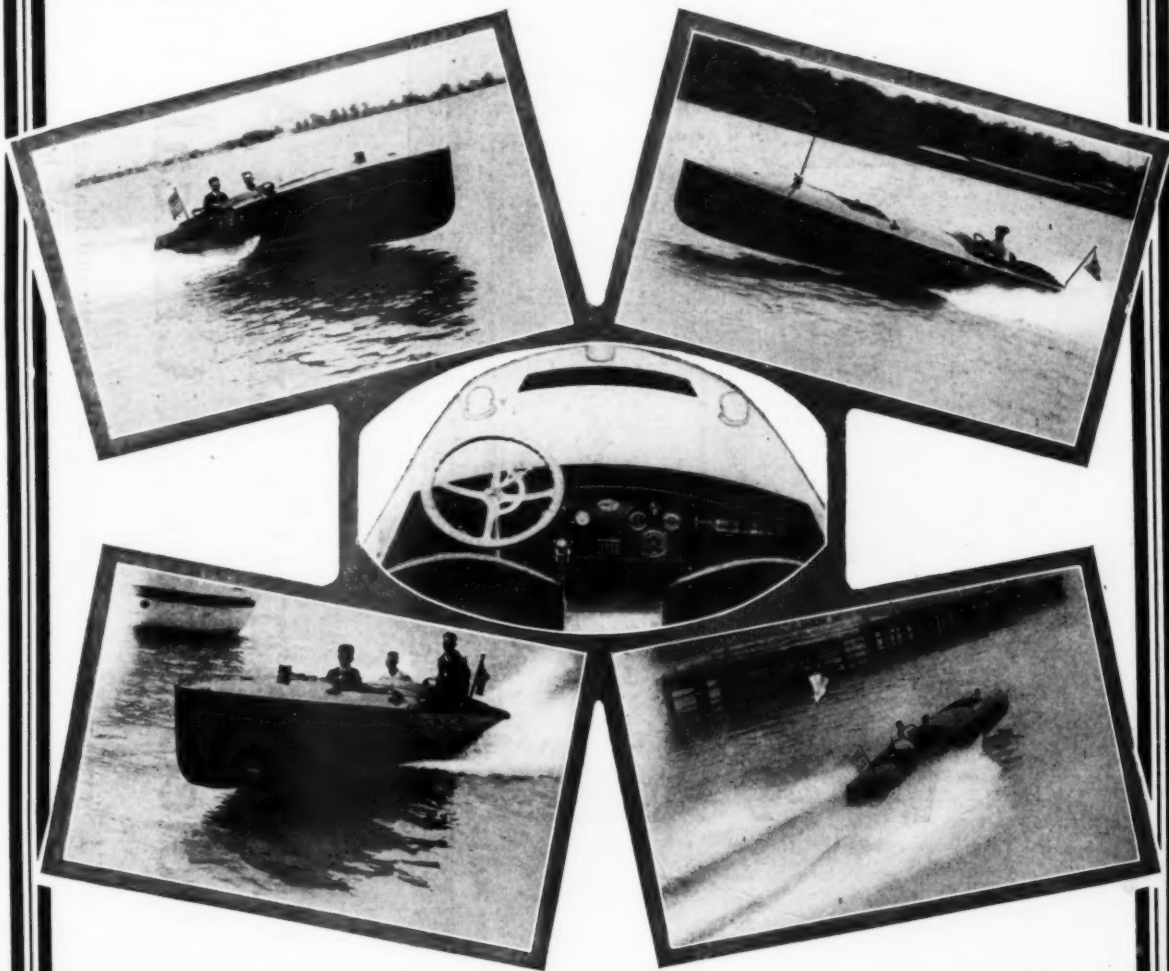
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## HACKER BOAT COMPANY

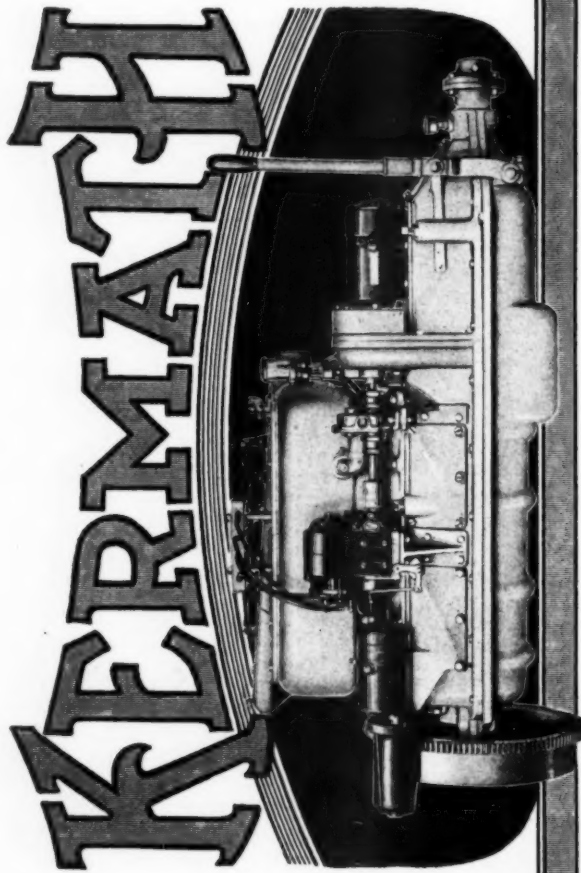
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## Why Kermath Engines Are First Choice Among Critical Buyers

**O**WNERS everywhere tell us that they like a Kermath Marine Engine because it *always runs*. The more a man knows about Marine Engines the better he realizes that there is a great difference in them—that some are better than others.

Kermaths are known to live up to their reputation—and their reputation is a high one.

Do you know that 60% of the country's boat builders specify Kermaths as standard equipment? These practical manufacturers are not likely to recommend something that has failed to prove its worth. Their own reputation is at stake.

Here's a Marine Engine of 4 cylinders that consumes but half the usual amount of fuel—whose design eliminates vibration—that is not liable to common ignition troubles—that runs as long as oil and gas are supplied. This briefly describes a Kermath.

We all know that good marine engines do not just happen—they are the result of steady development guided by ability and experience. Look up the best informed, most progressive dealer in your section. You will find him selling Kermath Marine Engines. He is a good man to get acquainted with.

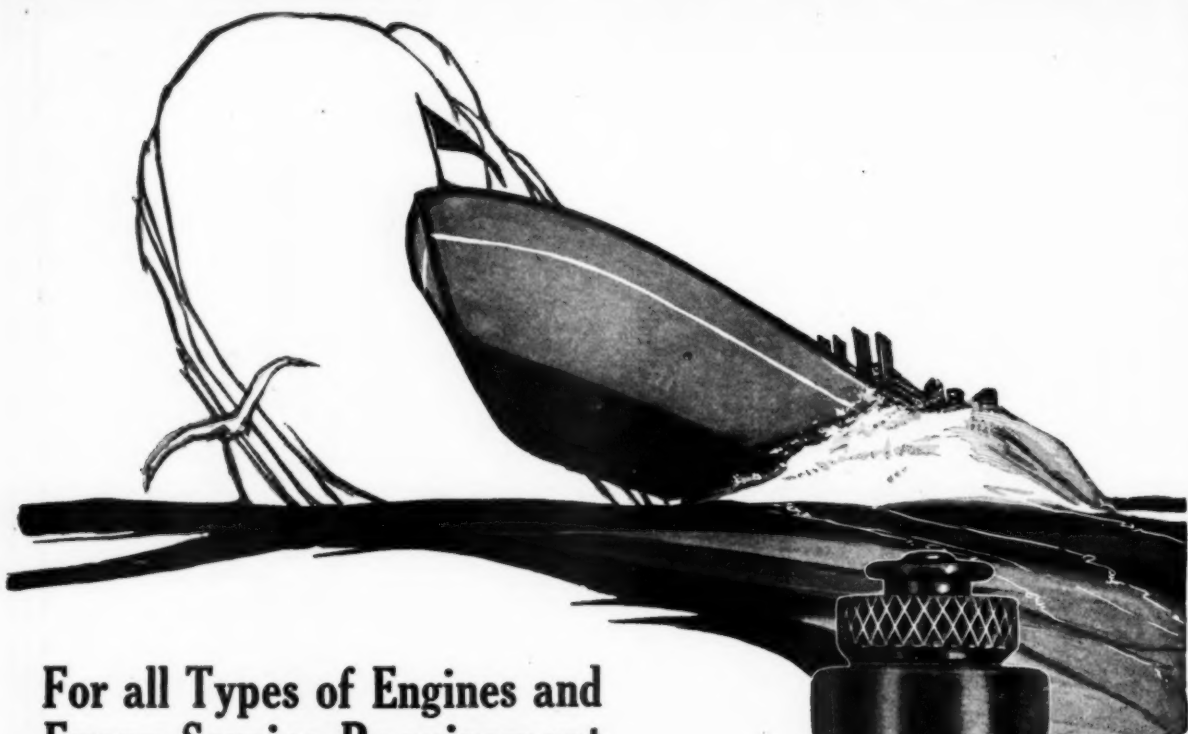
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The genuine Champion Spark Plug has our No. 3450 Insulator with patented asbestos gasket construction which insures enduring service and certainty of performance.

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For Marine Engines  
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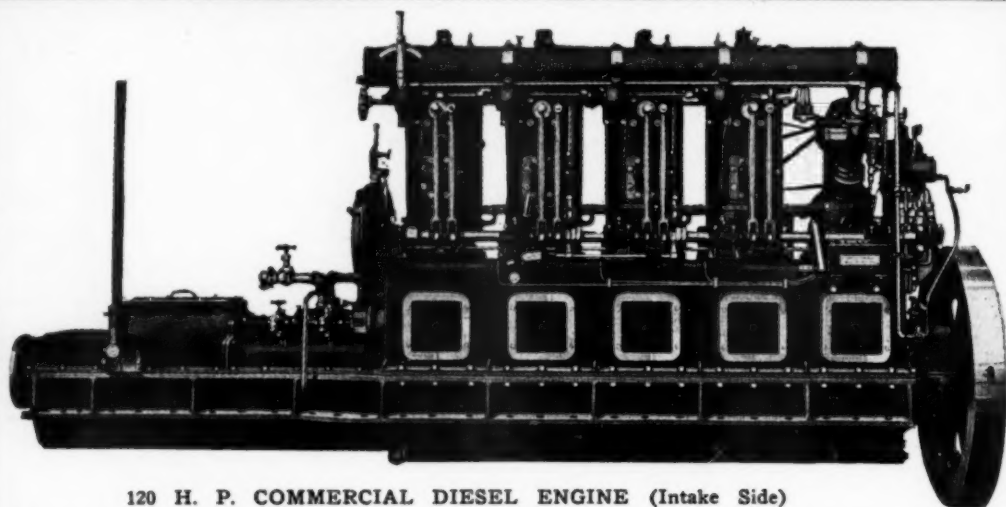
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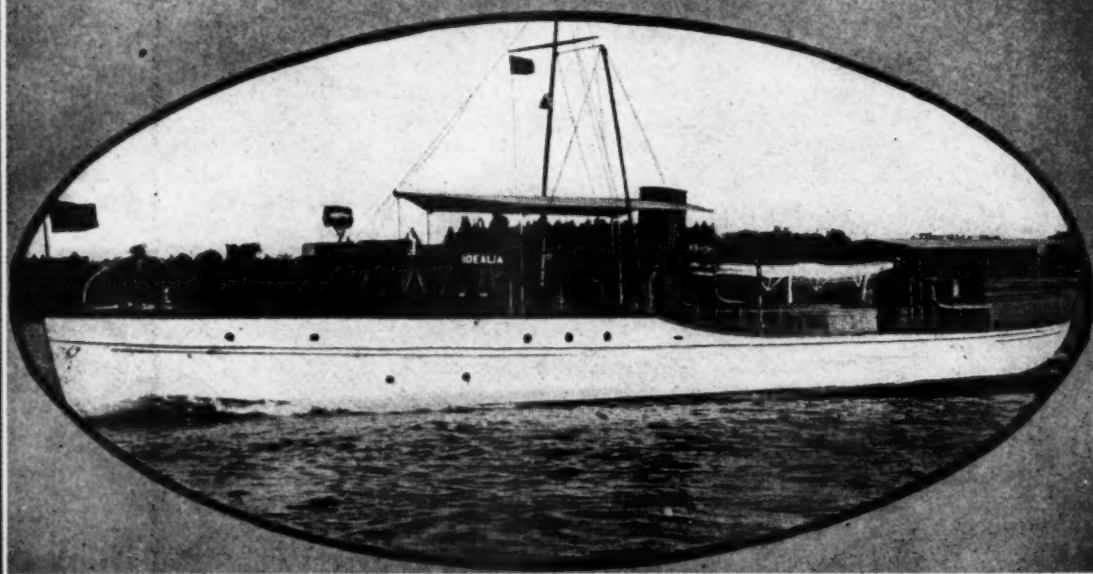
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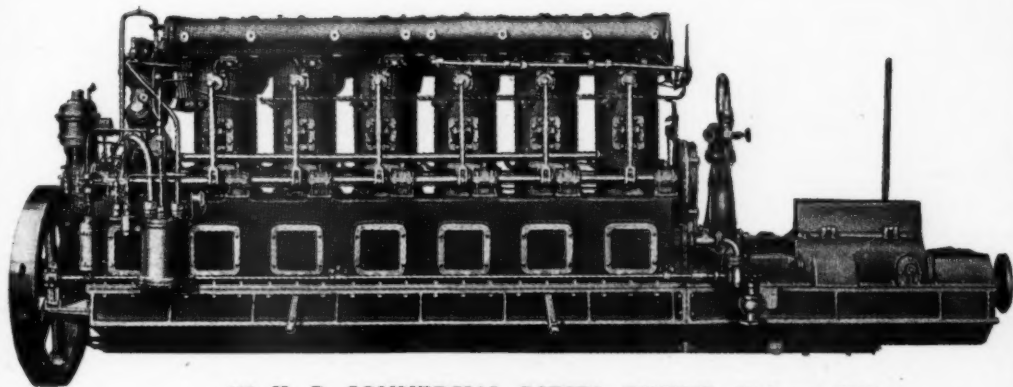
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"Economical, simple and entirely dependable" is this NELSECO in a yacht. Your new engine will be a duplicate if you want the best engine produced.



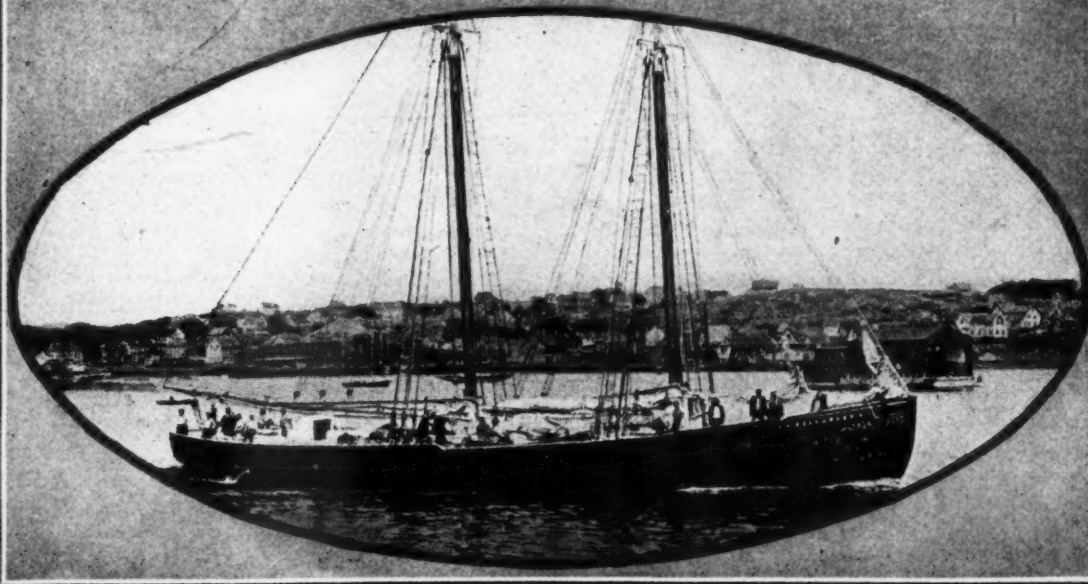




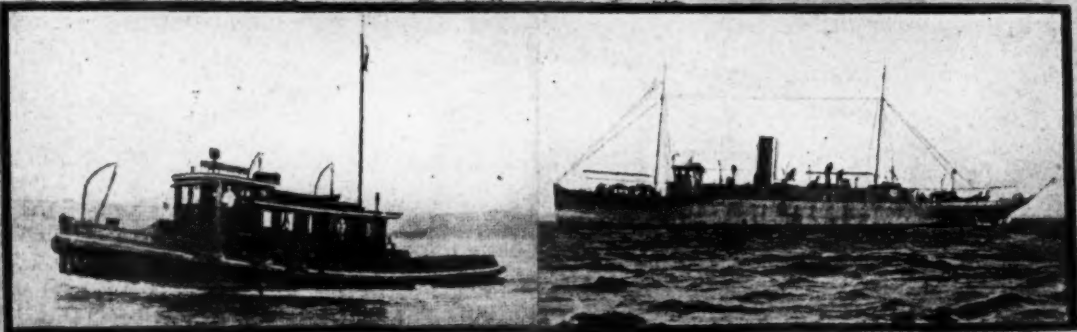
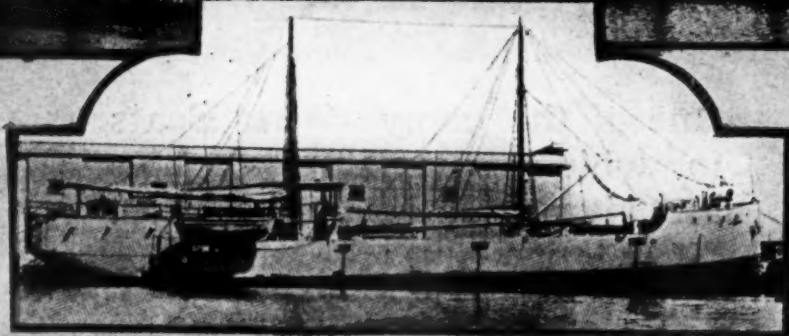
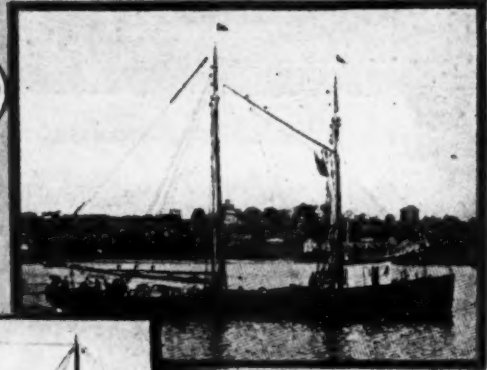
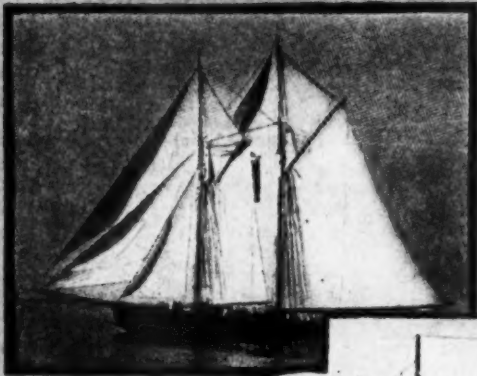
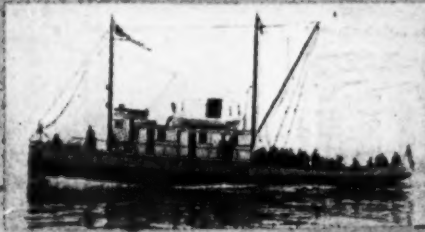
180 H. P. COMMERCIAL DIESEL ENGINE (Exhaust Side)

## Fishing Schooner "KILLARNEY"

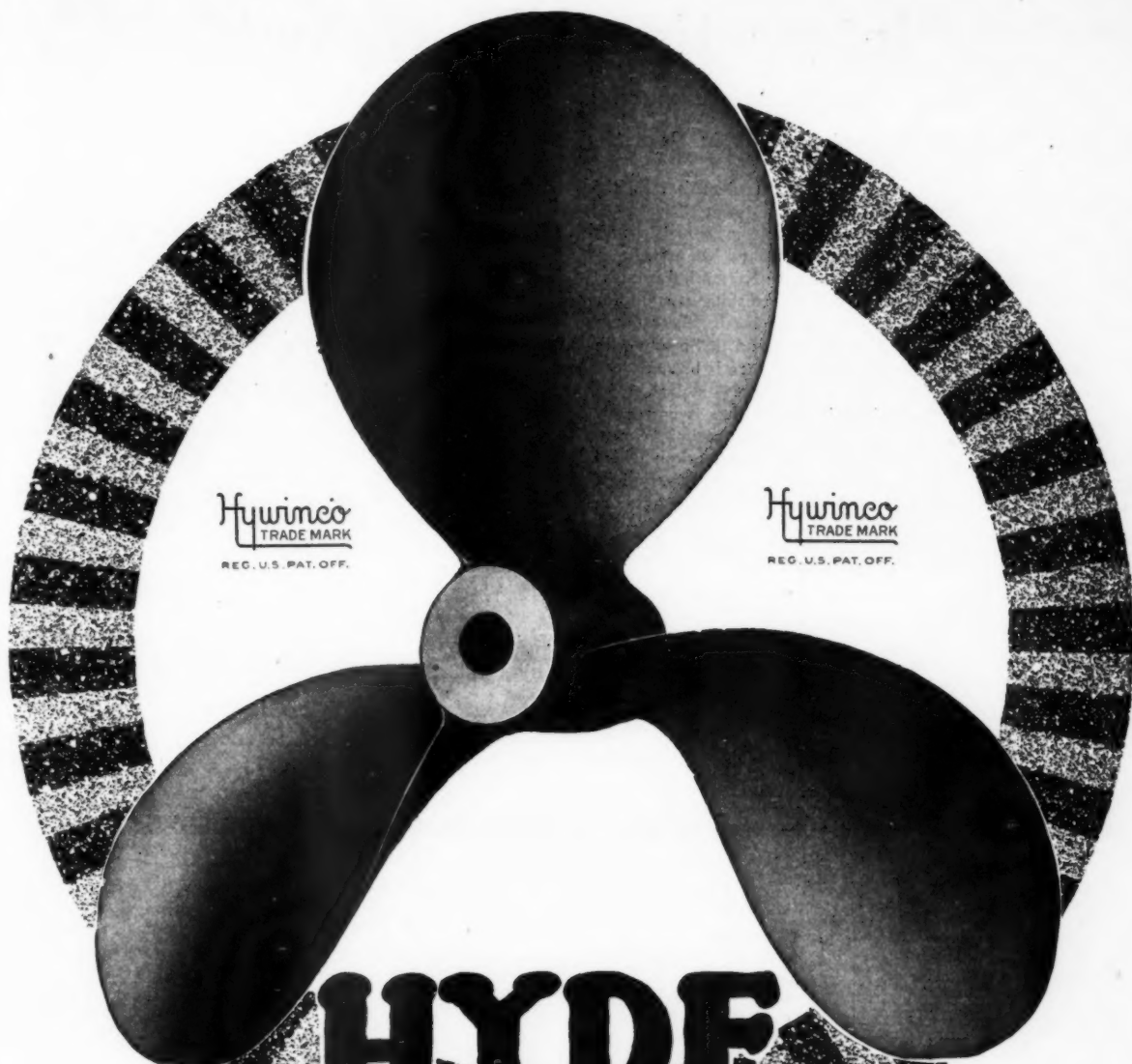
One of the many Work Boats  
in which NELSECO engines  
are giving Entire Satisfaction.  
We'll guarantee the same for  
your boat.



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**SPEED**

**EFFICIENCY**

**RELIABILITY**

For every kind of engine and every type of hull.

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# "International Thirty-two"

1920 Standardized Cruiser—Cockpit Type

A Small Standardized Cruiser Built in Quantity and Sold From Stock to Power Boat Enthusiasts

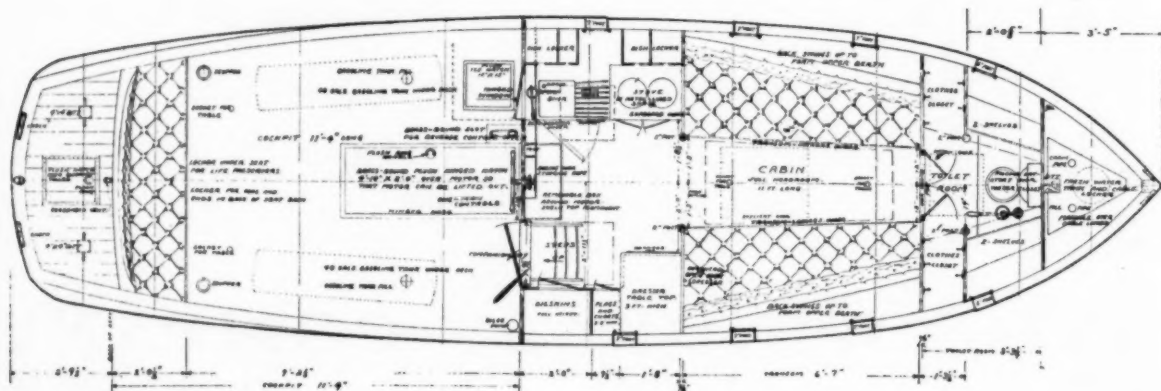
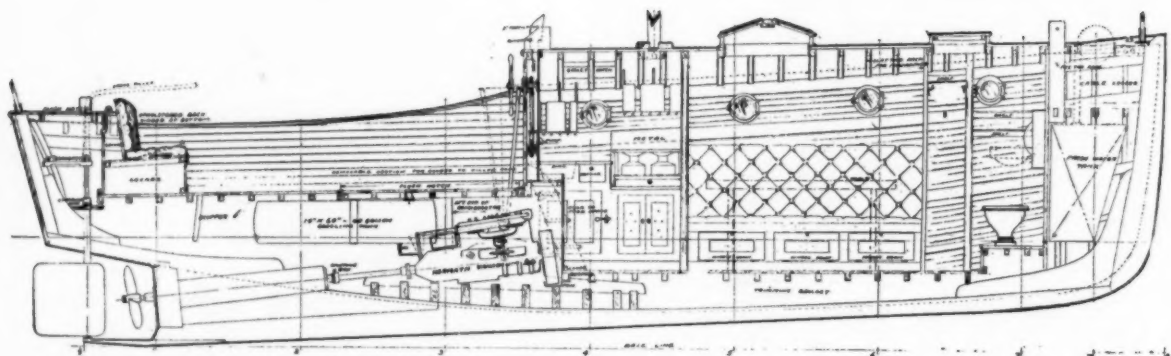
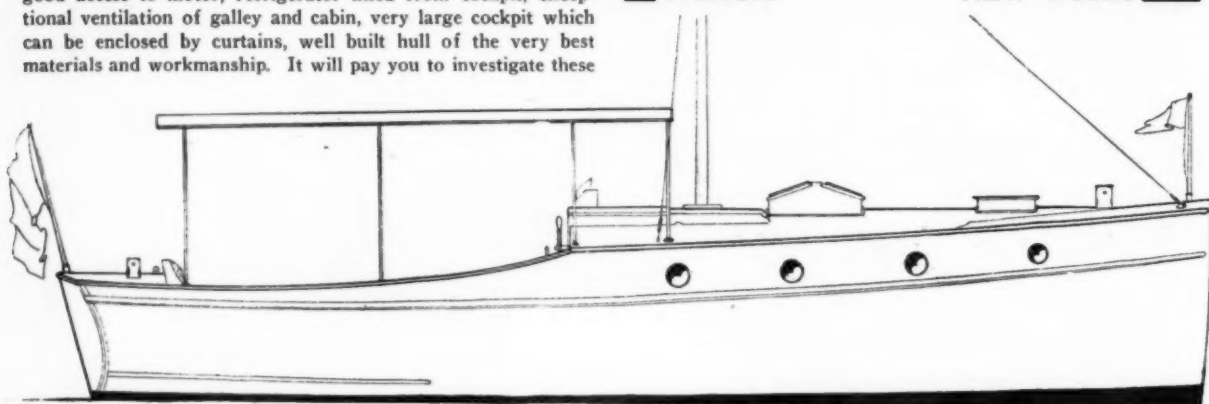
HERE is shown the best small standardized cruiser on the market today. When you visit the Motor Boat Show, Feb. 21-28, you will see one and can judge for yourself. This cruiser is 32 ft. long, 9 ft. beam, draws 3 ft. and has 6 ft. headroom. She will make 10 miles an hour with Kermath 4 cylinder 4 cycle motor, with electric starter, also furnishing current for electric lights. She sleeps four on separate berths, the cabin is completely furnished and finished in white and mahogany with dark blue upholstery. All the interior hardware is bronze, deck hardware galvanized, equipment of the best standard type. Tanks are seamless steel, plumbing by Mott, there is extremely good access to motor, refrigerator filled from cockpit, exceptional ventilation of galley and cabin, very large cockpit which can be enclosed by curtains, well built hull of the very best materials and workmanship. It will pay you to investigate these

cruisers built in quantity on a real standardized basis which reduces the cost per boat and enables us to sell them at the price we are quoting. You can test one before purchasing.

Price complete ready to use

**\$3500**

**I** **INTERNATIONAL** **L**  
Shipbuilding and Marine Engineering Corporation  
NYACK NEW YORK



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# "International Thirty-two"

1920 Standardized Cruiser—Bridge Deck Type

The Biggest Thirty-two Foot Cruiser Ever Built—Double Cabin Arrangement

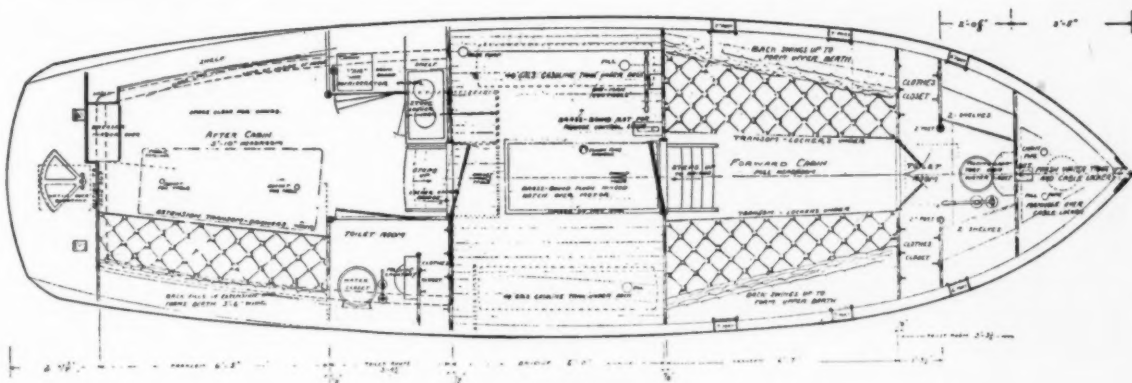
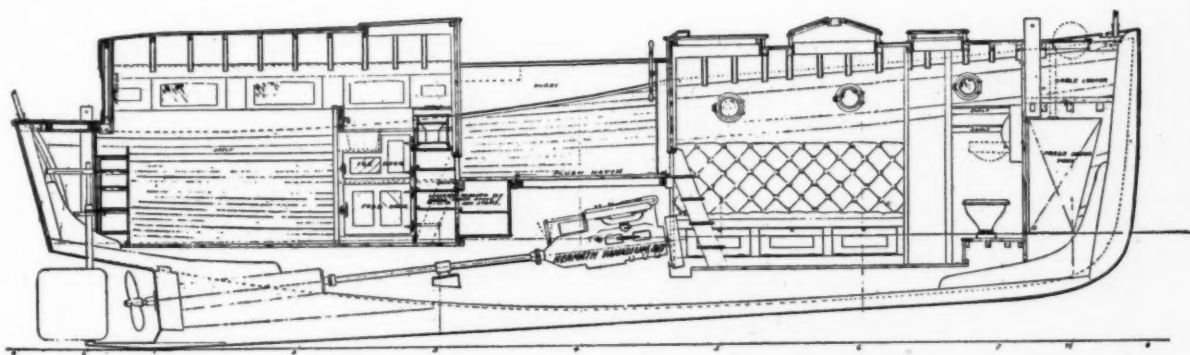
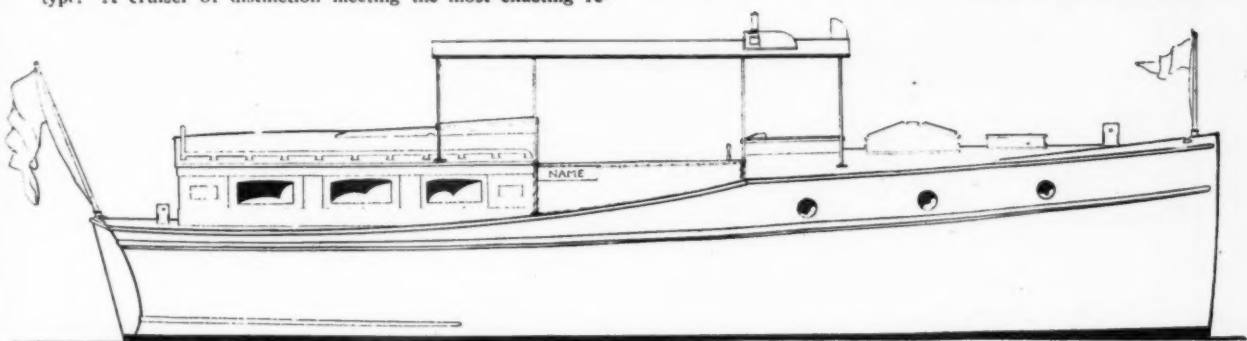
HERE is the same hull as the cockpit type cruiser with a different cabin layout which is proving very popular. This plan affords more real cruising comfort and accommodation than any 32 foot cruiser we know of, regardless of price. Here are two separate cabins with full headroom and toilet room. In the forward cabin are four single berths and in the aft cabin is a double berth 42 inches wide, dresser, and clothes space. A completely equipped galley with an ice box filled from the six foot cockpit, is also here and during the day this room makes a wonderful large living room. The cockpit can be enclosed, and adds another room as well as affording comfort. Finished in beautiful white enamel and mahogany with dark blue upholstery. Engine, equipment, etc., identical with cockpit type. A cruiser of distinction meeting the most exacting re-

quirements. Speed of ten miles. See one of these cruisers at the Motor Boat Show in New York, Feb. 21-28, and then order one.

Price complete ready to use

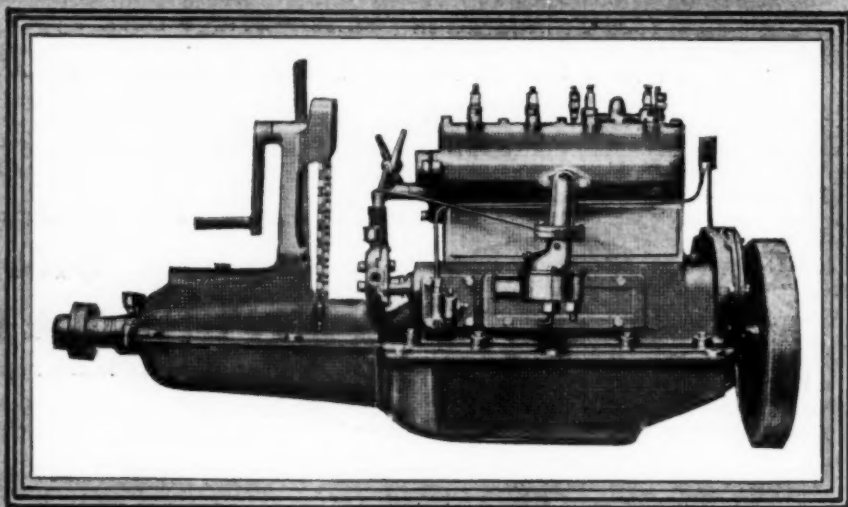
**\$4000**

**INTERNATIONAL**  
Shipbuilding and Marine Engineering Corporation  
**NYACK NEW YORK**



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THE WORLD'S STANDARD SMALL MOTOR

*Universal*  
**MOTOR**

As nearly perfect as it is possible to build a motor, the Universal will bring you pleasure and satisfaction heretofore unknown to motor boatmen.

Let us tell you all about it in our Latest Bulletin No. 29.

**UNIVERSAL MOTOR COMPANY**

**OSHKOSH**

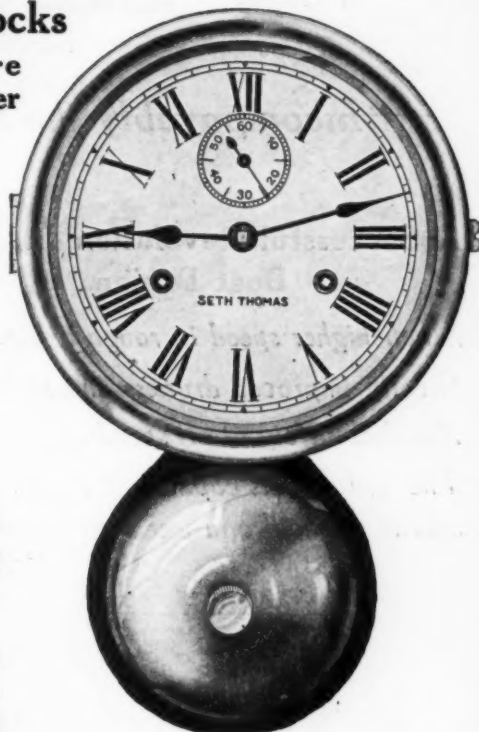
**WISCONSIN**



# SETH THOMAS

## Marine Clocks

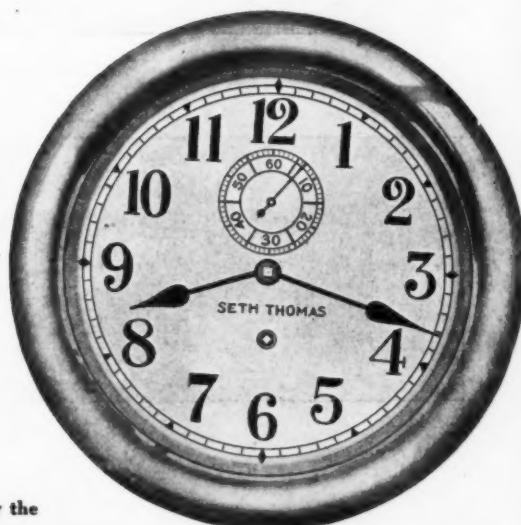
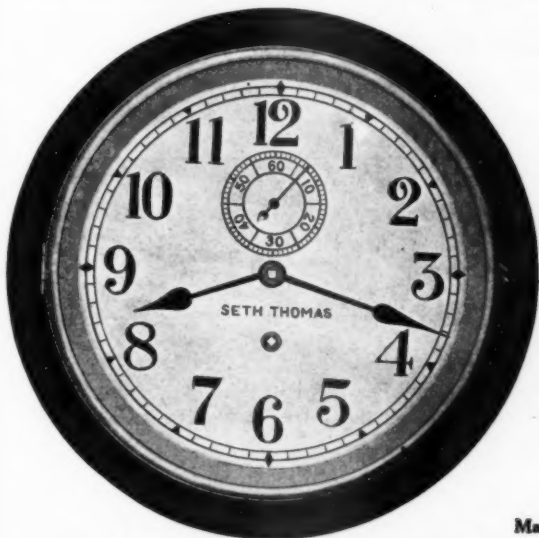
There Are  
None Better



Illustrations represent some of the patterns that the U. S. Navy and U. S. Shipping Board used thousands of during the war.

In April you can obtain of your jeweler a circular illustrating and describing the complete line of highest grade 8-day jeweled time and 8-day jeweled ship's striking clocks in various types of cases; also of medium grade time and ship's strike clocks.

Suitable for Home, Clubs, Steamships, Boats of all kinds, for gifts, etc., etc.



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surface-propeller boats

Trade Mark Reg. U. S. Pat. Off.

*Incomparably the finest sea boat in the world*

## A Successful Revolution In Motor Boat Design.

*Much higher speed in rough water.*

*Greatly improved dryness and stability.*

*Absolute safety at all speeds.*

*The only boats capable of running at all speeds in shoal and weed-grown waters.*



16-Foot Sea Sled



24-Foot Sea Sled at 36 Miles Per Hour



50-Foot Sea Sled at 50 Miles Per Hour

BOEING AIRPLANE CO.  
Seattle, Wash.

**THE SEA SLED COMPANY**  
BOSTON, MASS.

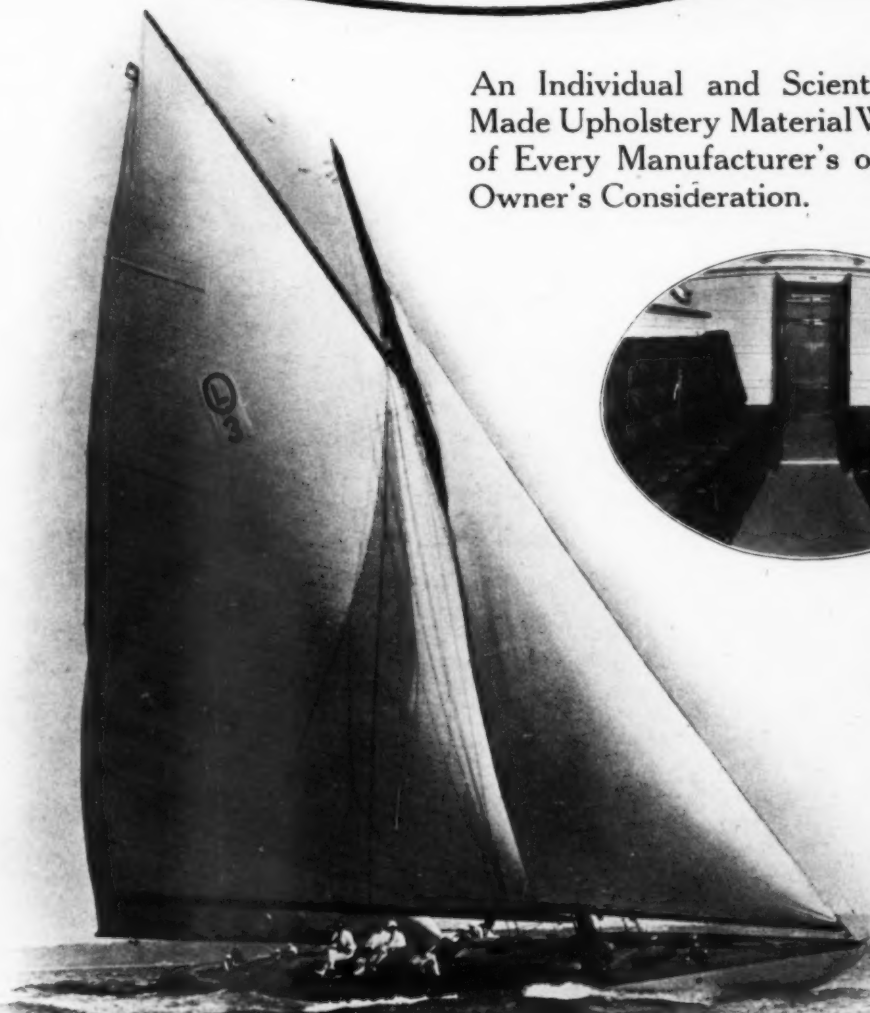
VIPER CO. LTD.  
Pictou, Nova Scotia,  
Canada.

THE BETTER UPHOLSTERY MATERIAL FOR BOATS

# CHASE Leatherwove

Made by Sanford Mills  
Sanford, Maine

An Individual and Scientifically  
Made Upholstery Material Worthy  
of Every Manufacturer's or Boat  
Owner's Consideration.



When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating



DURABLE, WATERPROOF AND ECONOMICAL

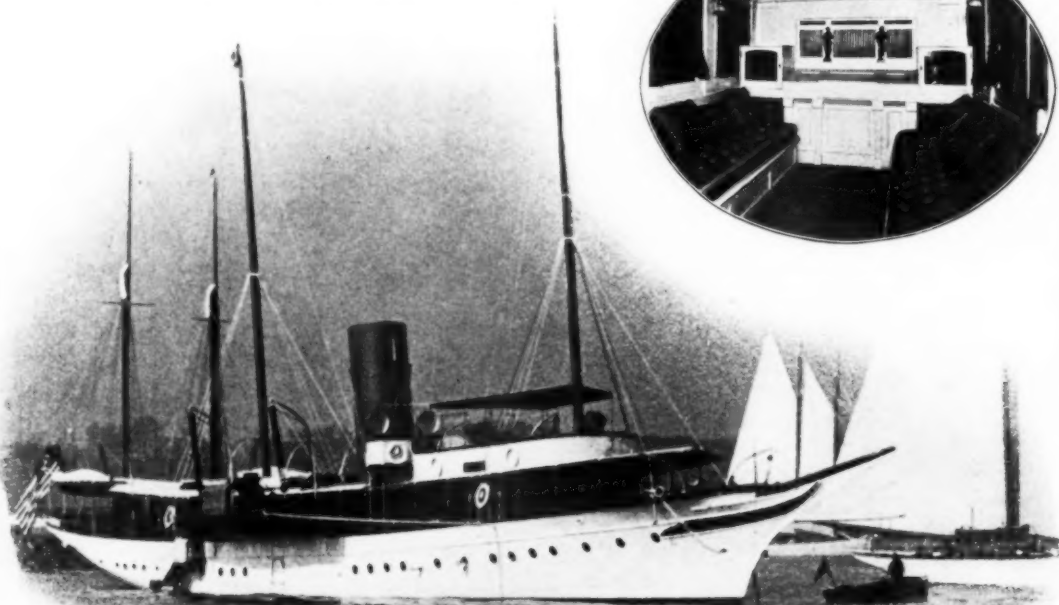
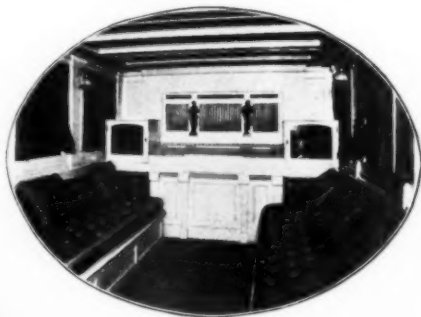
# CHASE Leatherwove

Made by Sanford Mills  
Sanford, Maine

## An Appropriate and Practical Material for Boat Upholstery

Chase Leatherwove, the result of years of scientific research and experiment, was produced to fill this want. And in Chase Leatherwove will be found an economical, wear-resisting, and waterproof material best suited to withstand changing climatic conditions.

Write for Samples. Finishes to  
harmonize with color schemes.



FOR RE-UPHOLSTERING BOATS USE

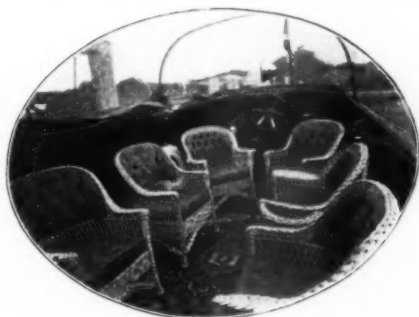
# CHASE Leatherwove

Made by Sanford Mills  
Sanford, Maine

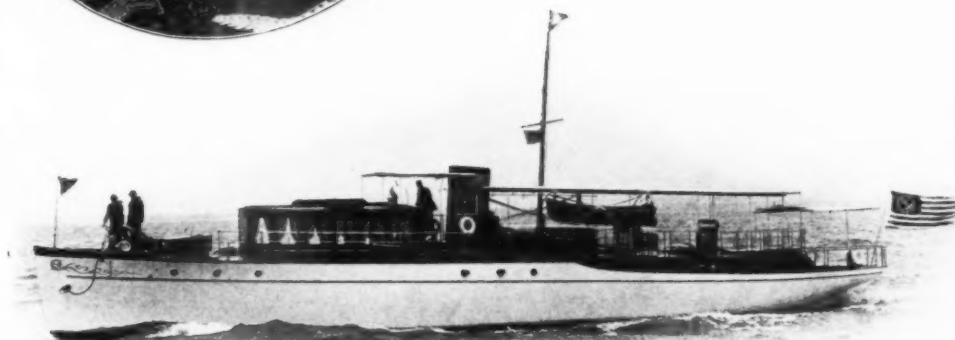
## Adds Beauty, Character and Distinction Wherever Used

Chase Leatherwove has a successful service record of more than twenty years; it is durable, especially tough, yet pliable, and rich appearing.

Boat owners and boat builders who specify Chase Leatherwove will be pleased with the resulting smart, distinctive appearance of the boat upholstery.



Variety of Colors and Patterns to Choose from.  
Plain Black to the Quaint Spanish effects in  
different weights.



*When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating*

1847 **CHASE** 1920

Chase Leatherwove is sold by L. C. Chase & Co.—leaders in manufacturing since 1847. Like all Chase products, Leatherwove is nationally recognized and is a reliable and honest product throughout.

Boat upholstery is subjected to the severest of tests of weather exposure and hard wear. That Chase Leatherwove successfully passes these tests is proven by boat builders, who have been specifying it for many years for every sort of boat upholstery—for cockpit or cabin—for individual chairs, cushions, etc.

## *Other Products of Our Mills*

**Plush and Wool Motor and Carriage Robes**

**Velmo Upholstery Fabrics    Velour and Linings**

**Furwove Fabrics                      Wexford Motor Cloths**

**Drednaut Motor Topping    Steamer Rugs**

**Motor and Carriage Cloths    Horse Clothing**

**Motor Car Specialties**

**L. C. CHASE & CO., BOSTON**

**NEW YORK**

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**SAN FRANCISCO**

**CHICAGO**

**Leaders in Manufacturing Since 1847**



## Through Arctic Waters *with* an **EVINRUDE**

Three hundred miles through the ice-choked Bering Sea—alone! That is the record of Sig. Arntzen, who traveled from Nome to Kotzebue in a small boat powered with an Evinrude Motor.

This shows what the Evinrude can do. It furnishes smooth, dependable power and can be attached to any rowboat, canoe or other small craft.

Built-in flywheel type magneto and automatic reverse are distinctive Evinrude refinements. The automatic reverse gives you instant control under all conditions. A special method of balancing practically eliminates vibration, making the Evinrude the desirable motor for fishing and hunting.

*Ask your hardware or sporting goods dealer. Or write for catalog.*

### **EVINRUDE MOTOR CO.**

**224 Evinrude Bldg.,**

**Milwaukee, Wis.**

#### **DISTRIBUTORS:**

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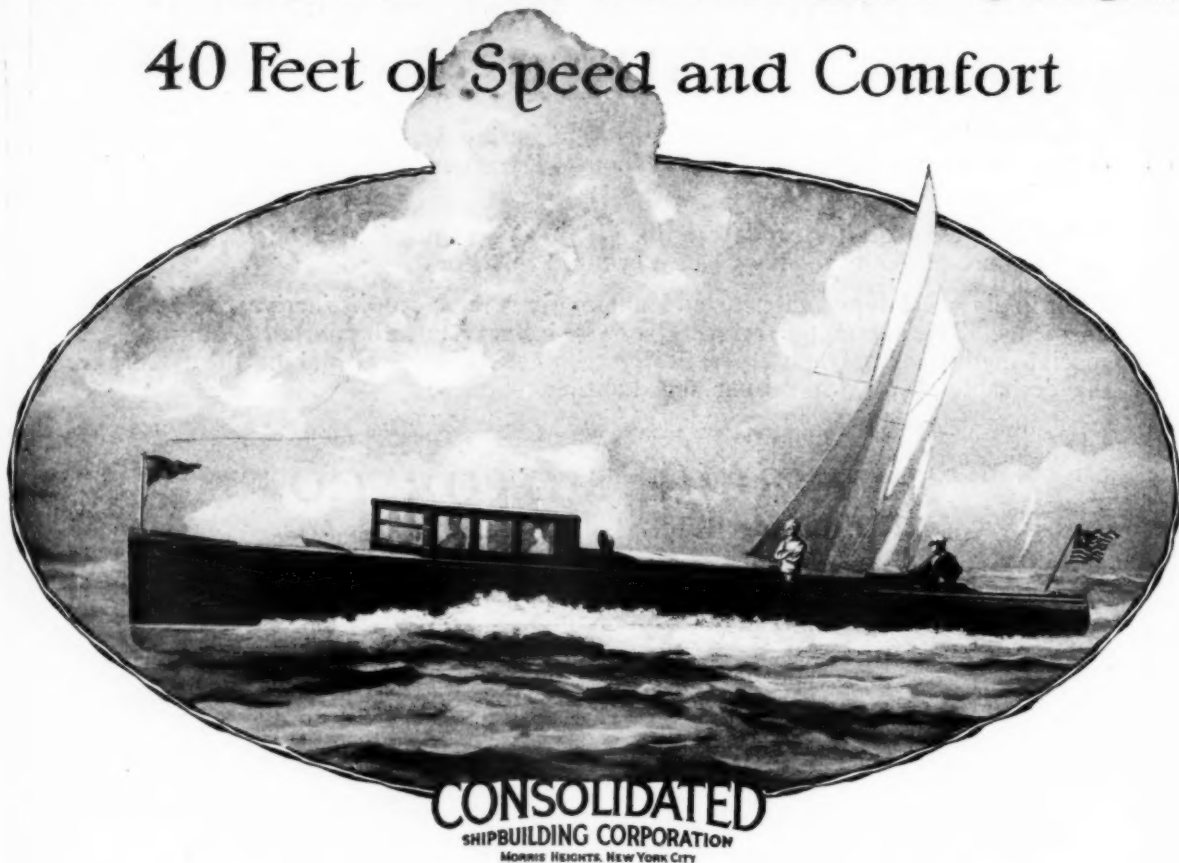
436 Market St., San Francisco, Cal.  
211 Morrison St., Portland, Ore.



## **EVINRUDE**

**DETACHABLE MOTOR FOR WATERCRAFT**

# See This Runabout at the New York Motor Boat Show 40 Feet of Speed and Comfort



**A** SMART LOOKING RUNABOUT powered with our 150 horsepower Speedway Motor makes it still smarter.

Its aristocratic design cannot help winning your admiration. We will exhibit this Speedster at the Motor Boat Show to be held in the Grand Central Palace, New York City, Feb. 20-28. Several of our stock boats, including Coupé Yacht Tenders, together with a complete line of our Speedway Engines, will also be exhibited.

---

*Represented in Miami by Mr. Clement G. Amory*





## THE HOME OF "THE BEST BOATS BUILT"

**W**HERE three thousand boats have been built during the past thirty-five years.

When you choose a builder, you want those elements which are found in an old reliable, well-established company.

You want the natural aptitude and talent which must follow in the wake of long experience.

*We are the designers and builders of the  
Famous SPEEDWAY Gasolene Engine.*

**CONSOLIDATED**  
SHIPBUILDING CORPORATION  
MORRIS HEIGHTS, NEW YORK CITY



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*Don't Delay—Space is Limited*

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Eleventh National

# Motor Boat *and* Engine Show

*Auspices—New England Engine and Boat Association*

## BOSTON

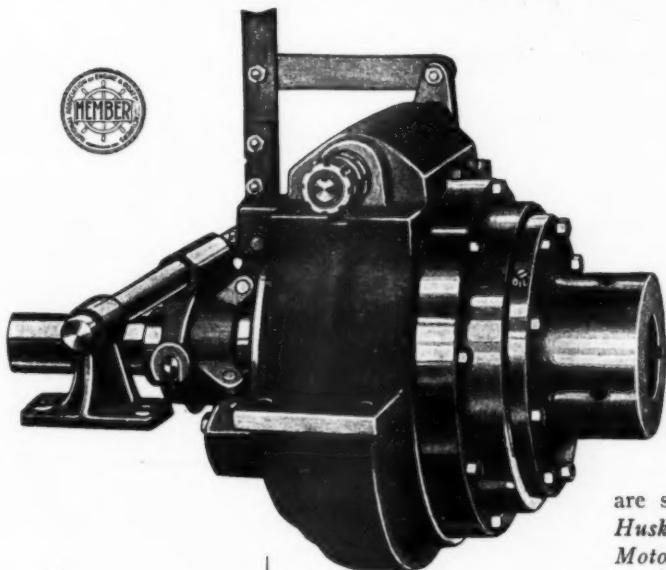
Mechanics' Building  
March 27th to April 3rd

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# THE HUSKY JOES



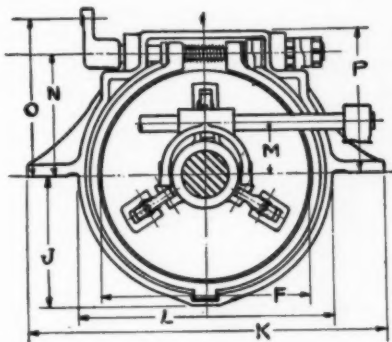
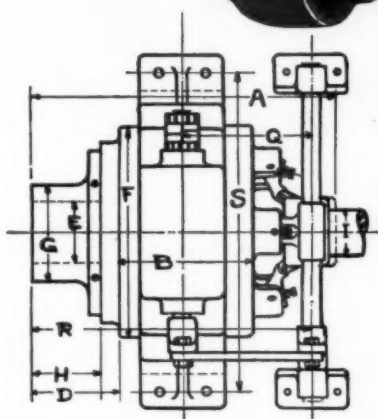
Selected for their Heavy Duty Motors by:

Nelseco  
Midwest  
Mianus  
Clay  
Gulowsen-Grei  
and others

Spaces 67-69 mezzanine at  
Motor Boat Show

85% Reverse Speed Ratio, Suspended non cramping Brake Band, Double Internal Gear Drive, Central Lubricating System, Removable Flange on Engine End,

are some of the features that make the Husky the ideal gear for Heavy Duty Motors.



No.	Wt.	H. P. Per 100 R. P. M.	Prices	A	B	C*	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
445	190	9	\$175	19 1/2	8 3/4	1 3/4	5 3/8	3	9 7/8	5 1/4	4 1/2	2 1/2	6	18	12 1/8	2 1/2	5 3/8	7 3/8	7 1/4	8 3/8	18 1/4	15 1/2
475	566	25	400	21 1/2	9 3/4	1 3/4	5 7/8	4 1/4	14 3/4	6 3/4	5	3 3/4	9 1/4	25	17 3/4	3 3/8	8 1/2	11	10 1/8	9 1/4	19 3/4	22 1/2
485	1,100	35	650	25 1/2	10 3/4	2 1/4	7 1/8	5 1/4	18 1/8	8 1/4	6	4 1/4	11 5/8	30	21 5/8	5	10 1/4	12 3/4	12 1/4	10 1/2	23 1/8	27 1/2
495	2,000	52	1055	32	13	2 3/4	8 3/8	5 1/2	22 3/4	10	7 1/8	5	13 3/4	35	26 1/4	5 1/4	12 3/4	15 3/4	14 3/4	13 1/2	29 1/4	31

\*Travel of operating collar.

In ordering, or writing for information, give bore, stroke, speed, number of cylinders of motor, cylinder compression, and fuel used; also diameter of crank shaft stub and keyway.

Propeller bored standard as "I" above. Insertable propeller stub and rear bearing extra.

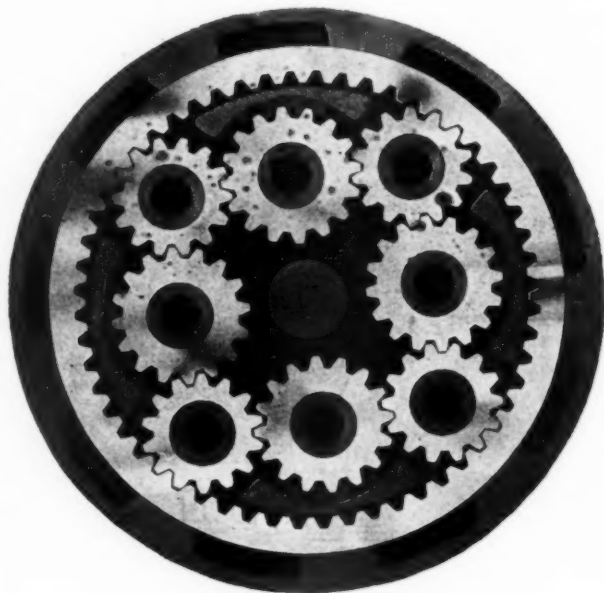
**The Snow & Petrelli Mfg. Co.**  
New Haven, Connecticut

THE FAMOUS HUSKY JOES REVERSE GEARS . THE SNOW & PETRELLI MANUFACTURING COMPANY

## The Snow & Petrelli Mfg. Co. Inventors and Pioneer Makers of Reverse Gears

**I**N adding the Husky to our line of gears, we are meeting the demand created by the recent and rapid development of the *Oil Burning Motor*. Here is a gear that is not cheap in any sense, but is designed and built to last as long and cause as little trouble as the motor itself.

Our aim is to cooperate with the motor manufacturer, the boat builder, and with all who are interested in the use and development of the motor boat for business or pleasure and to furnish the kind of equipment best suited to the various needs.



The unique and powerful gear set of the Husky showing the double Internal Gear Drive and the pinion gears with their Hollow Bearings which form oil reservoirs.

### Guarantee

We guarantee JOES GEARS and "ONE-WAY" CLUTCHES against defective workmanship and materials, and will furnish, free of cost, any defective parts for one year. We further guarantee that JOES GEARS are correctly rated in our list and we will refund the purchase price if any gear is returned to us as unsatisfactory, within thirty days after it has been installed.

Is our guarantee good? Our customers are our references. Ask anybody who uses JOES GEARS.

We are unable to give a full description of our line on these pages and therefore earnestly request that you write us for further information.

*Don't forget that Eighty-five Percent Reverse Speed Ratio means action. Low Reverse Speed Ratio means sluggishness.*

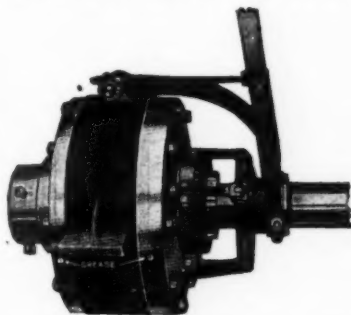


THE FAMOUS HUSKY JOES REVERSE GEARS . THE SNOW &amp; PETRELLI MANUFACTURING COMPANY

## The Joes Famous Reverse Gears

The *High Power Gears* are made especially for small high speed motors, but are adapted to any motor within their range of power, and may be used without Rear and Thrust Bearings if desired.

Bored at either or both ends or furnished with stub shaft if preferred.

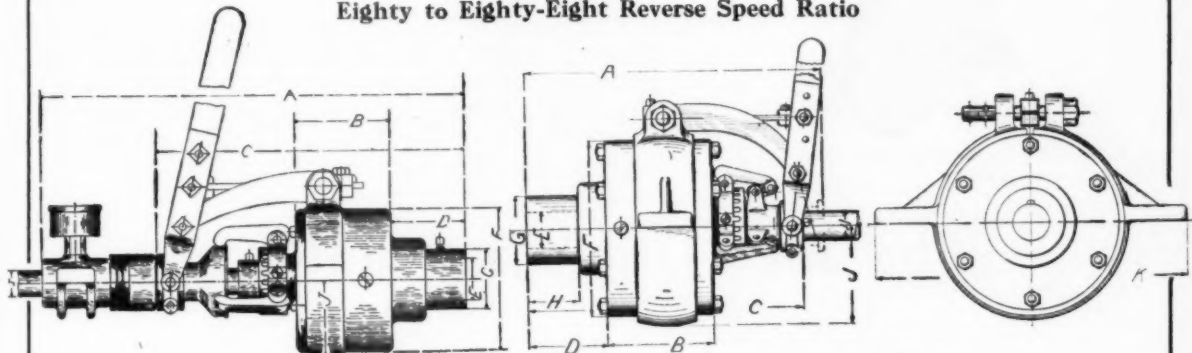


The *Duplex Drive Gears* are especially adapted to heavy duty motors where their very high ratio is vital for quick action on the reverse.

This type of Gear is also used on the Misses Detroit and other big cup winners.

Bored on engine end and furnished with stub shaft on propeller end. Rear and Thrust Bearings are necessary.

Eighty to Eighty-Eight Reverse Speed Ratio



High Power Type

Duplex Drive Type

	Size	Wght. Lbs.	Price	H.P. per 100 R.P.M.	For Motor H.P.	Rear and Thrust Bearings	DIMENSIONS IN INCHES										
							A	B	C	D	E	F	G	I	J	K	
High Power	17	18	\$33.00	$\frac{1}{2}$	1 to 8	\$5.50	14	$3\frac{1}{8}$	$10\frac{1}{4}$	$2\frac{1}{2}$	$1\frac{3}{8}$	$4\frac{3}{4}$	2	$\frac{7}{8}$	$2\frac{1}{2}$	9	
	19	19	38.50	$\frac{3}{4}$	3 to 10	5.50	$14\frac{1}{2}$	$3\frac{3}{8}$	$10\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{3}{8}$	$4\frac{3}{4}$	2	$\frac{7}{8}$	$2\frac{1}{2}$	9	
	27	42	46.75	2	4 to 20	6.90	$18\frac{1}{4}$	$4\frac{3}{8}$	$13\frac{1}{4}$	3	$1\frac{3}{4}$	6	$2\frac{1}{2}$	$1\frac{1}{8}$	$3\frac{1}{4}$	13	
	26	43	52.25	$2\frac{1}{2}$	5 to 25	6.90	$18\frac{1}{2}$	$4\frac{7}{8}$	14	3	$1\frac{3}{4}$	6	$2\frac{1}{2}$	$1\frac{1}{8}$	$3\frac{1}{4}$	13	
	37	90	88.00	$3\frac{1}{2}$	6 to 40	8.50	$20\frac{1}{2}$	$4\frac{3}{4}$	$15\frac{1}{2}$	$3\frac{5}{8}$	2	$8\frac{1}{8}$	$2\frac{7}{8}$	$1\frac{1}{4}$	$4\frac{3}{8}$	$14\frac{1}{2}$	
Duplex Drive	120	62	72.60	3	6 to 40	8.50	13	$4\frac{1}{4}$	12	$2\frac{1}{4}$	$1\frac{3}{4}$	$7\frac{1}{8}$	3	$1\frac{3}{8}$	$3\frac{7}{8}$	$12\frac{1}{4}$	
	130	85	82.50	5	7 to 60	8.50	$13\frac{1}{2}$	$4\frac{1}{4}$	$12\frac{1}{2}$	$3\frac{1}{4}$	2	8	$3\frac{1}{4}$	$1\frac{3}{8}$	$4\frac{1}{4}$	14	
	135	105	94.60	7	8 to 90	9.90	14	$4\frac{5}{8}$	13	$3\frac{1}{4}$	$2\frac{1}{4}$	$8\frac{3}{4}$	$3\frac{3}{8}$	$1\frac{1}{2}$	$4\frac{5}{8}$	$14\frac{1}{2}$	
	140	170	126.50	9	10 to 125	9.90	$15\frac{1}{2}$	6	$14\frac{1}{2}$	$3\frac{1}{4}$	$2\frac{3}{8}$	$9\frac{5}{8}$	$4\frac{3}{4}$	$1\frac{3}{4}$	$5\frac{3}{8}$	$19\frac{1}{2}$	
	150	260	169.40	12	12 to 200	16.50	18	$6\frac{3}{8}$	$16\frac{1}{2}$	$3\frac{1}{4}$	$2\frac{3}{4}$	$11\frac{3}{8}$	$4\frac{1}{2}$	$2\frac{1}{4}$	$5\frac{3}{4}$	20	
	160	345	223.85	15	15 to 250	25.00	19	$6\frac{3}{4}$	$17\frac{1}{2}$	$3\frac{1}{4}$	$2\frac{3}{4}$	$13\frac{1}{4}$	$4\frac{1}{2}$	$2\frac{1}{2}$	7	23	
	170	825	500.00	30	20 to 350	50.00	$23\frac{3}{4}$	8	$22\frac{1}{4}$	$5\frac{3}{4}$	$4\frac{1}{2}$	19	7	4	$10\frac{3}{8}$	31	

The E and I dimensions are maximum

NOTE—Single Cylinder Motors require larger gears per H.P. than multiple.

WRITE FOR QUANTITY PRICES ON YOUR SEASON'S REQUIREMENTS

In ordering mention the Diameter of Engine and Propeller Shafts and Keyways, Bore, Stroke, Speed, Number of Cylinders and Cycle of Motor, and if convenient the Size and Pitch of Propeller. Mention Rear and Thrust Bearings if desired.

Agents Wanted. See our exhibit at New York Motor Boat Show, spaces 67 and 69 mezzanine floor.

**The Snow & Petrelli Mfg. Co.**  
New Haven, Connecticut

THE FAMOUS HUSKY JOES REVERSE GEARS . THE SNOW &amp; PETRELLI MANUFACTURING COMPANY

## The Joes Safety Rear Starter

Positive protection against injury from "kick-back"



Safety Rear Starter with Adjustable Frame

THE CHAIN IS IDLE WHEN THE MOTOR IS RUNNING

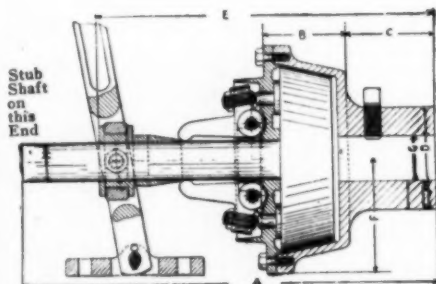
Size No.	Price Plain	Price with Safety	Fast Motors H.P.	Slow Motors H.P.	Height to Center	Width between Bed Screws
20	\$27.50	\$44.00	8 to 30	4-8	14"-20"	8"-18"
40	44.00	61.80	20 to 50	8-20	14"-20"	8"-18"

Special starters for larger motors.

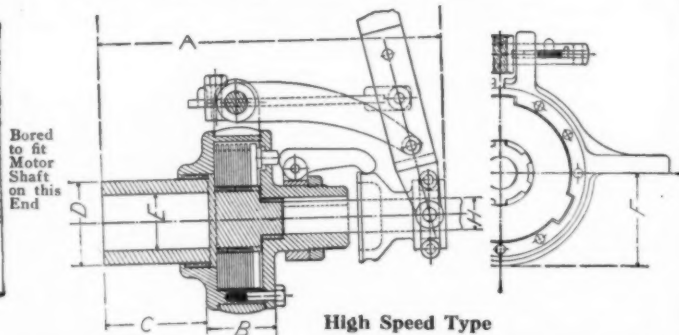
The plain starter is just as efficient but offers no guard against injury in case of kick-back.

*Note:* The plain starter is reversible, but the safety starter must be made right hand or left hand as required, therefore state the direction in which you intend to crank to start your motor. Also give size of shaft or hub where lower sprocket is to be attached and the size of keyway for either plain or safety.

## The Joes One-Way Clutch



DIMENSIONS—Regular Type



High Speed Type

Size	Price	Wt.	H.P. per 100 Rev.	A	B	C	D	E	F	G	H
12	\$19.80	24	2	16 3/4	2 3/4	3	3	11 1/2	3	1 3/4	1 1/2
13	31.70	40	3 1/2	17 3/4	3	3	3	12 1/2	3 1/2	2	1 1/4
14	42.20	60	5	19 1/2	3 1/4	3 3/4	3 1/2	14 1/4	4 1/4	2 3/4	1 1/2
15	65.00	125	8	24	4 1/2	4 1/2	4	18	5 1/2	2 1/2	1 3/4

Size	Price	Wt.	H.P. per 100 R.P.M.	A	B	C	D	E	F	H
11 1/2	\$33.00	16	3	9 1/4	1 7/8	2 3/4	2 1/4	1 1/2	2 1/2	1
21 1/2	50.00	40	7	12 1/2	3	3 1/2	2 1/2	1 3/4	3 1/4	1 1/4
31 1/2	72.60	70	12	14	3 5/8	3 1/2	2 7/8	2	3 1/2	1 3/8
61 1/2	Special	225	25	16	3 3/4	3 1/2	4 1/2	3	7 1/4	2 1/2

When ordering gears or clutches give diameter of both the *Engine and Propeller Shafts and Keyways, Bore, Stroke, Speed, Number of Cylinders and Cycle of Motor*, and if convenient the *Size and Pitch of Propeller*. High Speed type furnished bored at both ends. All prices subject to change without notice.

## The Snow & Petrelli Mfg. Co.

Agents Wanted

New Haven, Connecticut

Everywhere



## 'As Easy As Taking Out Your Spark Plug

**R**EMOVING a Frisbie valve is as easy as taking out a spark plug. Carry an extra valve unit among your spare parts. When a valve needs cleaning or grinding, replace it with your spare and keep right on. No delay.

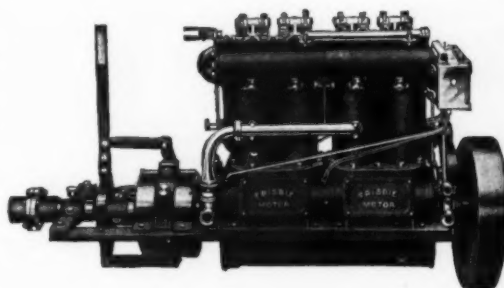
This is another special feature that adds to the popularity of Frisbie Motors. For more than 15 years all Frisbie valves have been set in the cylinder heads in removable valve cages.

### Send for Literature

And don't forget to ask about our special Kerosene Equipment. Cheaper than gasoline.

### VALVE-IN-HEAD FOR FIFTEEN YEARS

1-cyl. ....	5 and 7 H.P.
2-cyl. ....	10 and 16 H.P.
3-cyl. ....	18 and 25 H.P.
4-cyl. ....	30 and 40 H.P.
6-cyl. ....	50 and 75 H.P.



## FRISBIE MOTOR COMPANY

7 COLLEGE STREET, MIDDLETOWN, CONN.



# Frisbie an' I

"Glad to see you at the New York Show.  
Bring your engine problems and let us help you."

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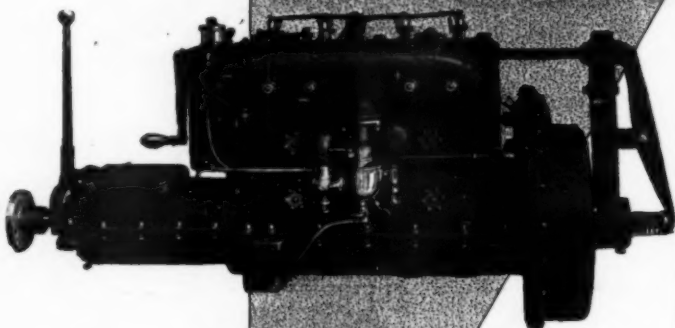
## One of these Will Meet Your Needs

Somewhere in the line of Lockwood-Ash Marine Engines is one that will meet your needs.

From the clean-cut, sturdy 2 h.p. outboard engine to the big four-cylinder power plant are varieties in size to cover a wide range of power and speed requirements.

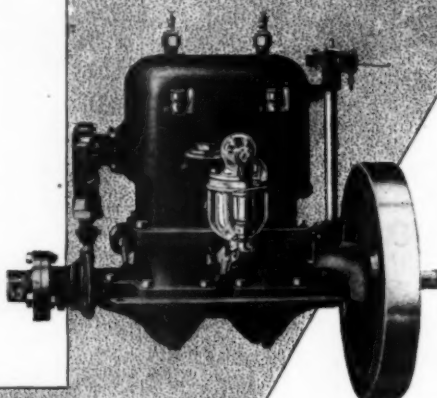
Fourteen years of experience enable Lockwood-Ash officials to act as your consulting engineers in boat engines.

Prompt and serious attention to every inquiry is a Lockwood-Ash rule.



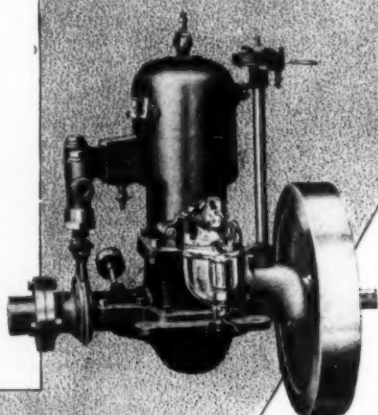
**4-Cylinder  
4-Cycle**

Big brother of the Lockwood-Ash Engine family, a highly developed marine power plant. Rugged and dependable. Delivers up to 20 h. p. Built with or without rear starter.



**2-Cylinder  
2-Cycle**

A light, compact all-purpose engine, of few parts and readily accessible. Made in three sizes, 6-8 and 12-h. p. The largest size should deliver up to 15 miles per hour.



**1-Cylinder  
2-Cycle**

A simple, dependable in-board engine for work or pleasure. Easy to start; easy to operate and care for. Made in 2½ and 4 h. p. sizes.



**Outboard  
Row Boat  
Engine**

This portable, 2 h. p. engine is a favorite for both pleasure and work. Easily attached to a row boat. Full of pep and thoroughly reliable.

### Why Lockwood-Ash Engines Are Worthy of Your Choice

Lockwood-Ash Marine Engines are products of an institution which always has placed quality first. Experience has pointed out the sizes that make up the well-selected line and the quality standard has dictated the thorough workmanship which is in every Lockwood-Ash Engine.

Lockwood-Ash Engines are mechanically sound—not experiments. They are built simple in principle and strong in practice.

#### Ask for the Booklet

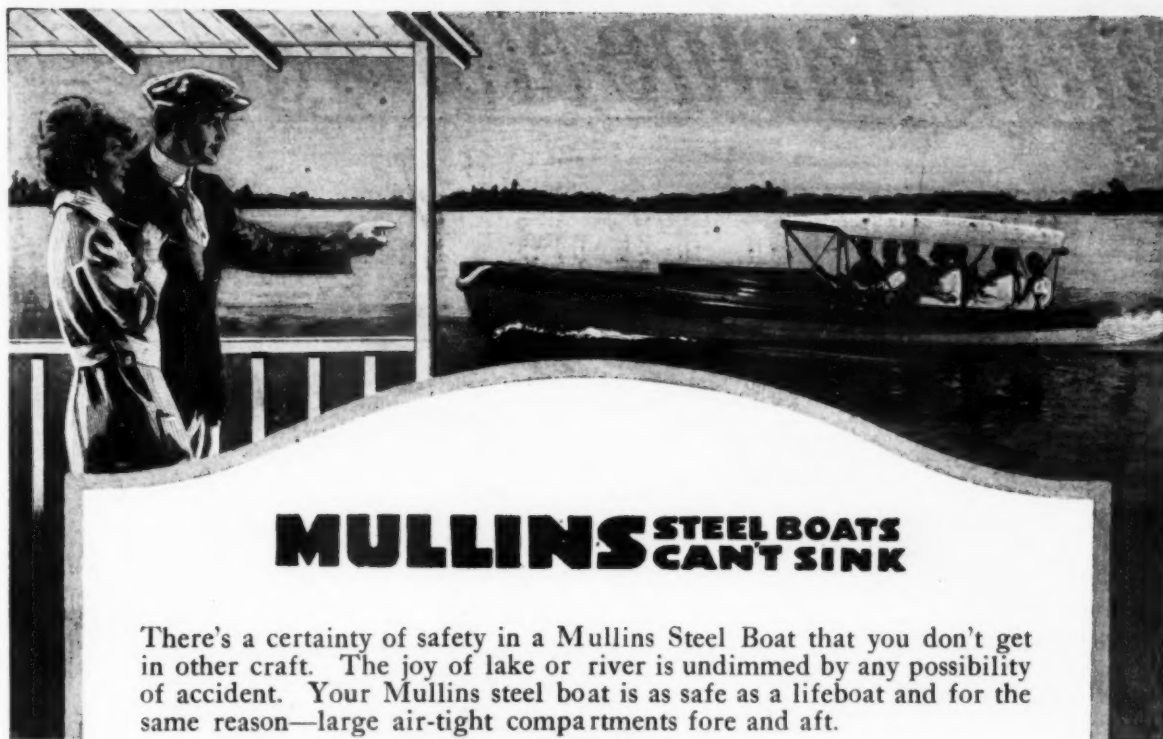
Ask for the booklet that tells all about Lockwood-Ash Engines. Also ask about the 30-day trial plan.

**LOCKWOOD-ASH MOTOR CO.**

2007 Jackson Street  
JACKSON, MICHIGAN

**LOCKWOOD-ASH**  
MARINE  **ENGINES**

(53)



## MULLINS STEEL BOATS CAN'T SINK

There's a certainty of safety in a Mullins Steel Boat that you don't get in other craft. The joy of lake or river is undimmed by any possibility of accident. Your Mullins steel boat is as safe as a lifeboat and for the same reason—large air-tight compartments fore and aft.

The puncture-proof steel hull has the shock resistance of one-inch oak planking. These boats combine absolute safety with a lightness, grace and buoyancy which make them real joy-craft on any waters.

Mullins boats have been leaders for 22 years. They are designed by America's foremost naval architects in the world's largest boat factory. They cannot leak, crack or open at the seams. These boats never need calking and since they are not affected by the weather you do not have to build a boat house.

Mullins launches are powered with Wisconsin, Kermath, Universal, Pierce-Budd and Arrow motors, with patented Silent Under Water Exhaust, making the Mullins the cleanest and quietest boats afloat.

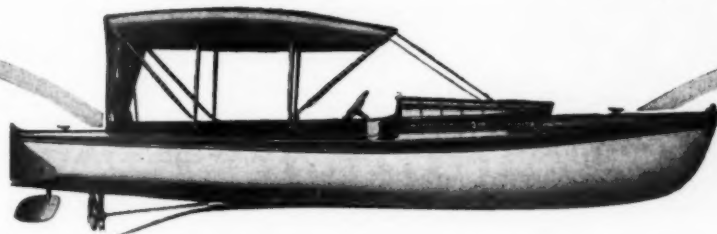
They offer safety, service, comfort, the three requirements for real motor boating pleasure.

Write for the big Mullins catalog beautifully illustrated. Lists more than 40 models of steel and wooden power boats, rowboats and canoes.

## MULLINS BODY CORPORATION

*Boat Department*

601 Franklin Street, Salem, Ohio



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# Gray Marine Motors for 1920

## PRODUCTION Increased

### Overhead Valves

This is the day of overhead valve motors. All the aeroplane motors—also the Reo, Marmon, Chevrolet, Buick, Nash and a host of others have adopted the overhead valve—it is more efficient, more powerful and more accessible.

### Back-firing

This motor cannot backfire and set fire to your boat.

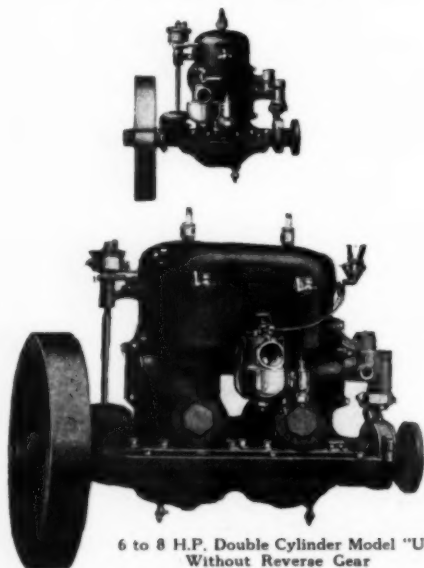
### Kerosene or Gasoline

All gasoline now is poor stuff, the motor designed five or six years ago uses it, but not satisfactorily. It takes a different design of intake to properly use this low grade fuel. Our HOT SPOT cylinder head uses not only gasoline of the poorer grades, but even kerosene and gives absolute control, flexibility and a clean motor.

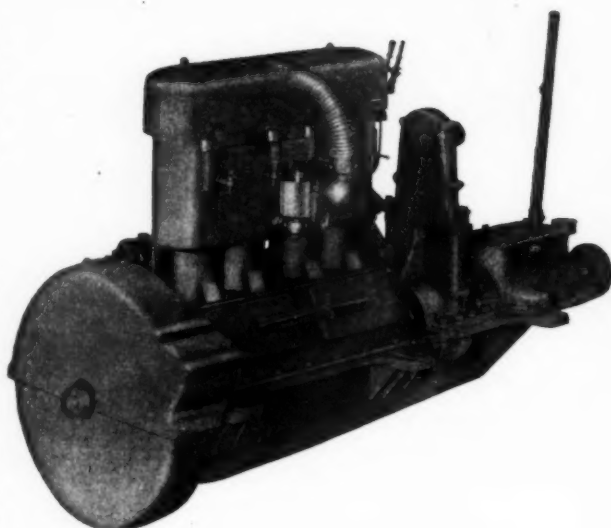
**Gray 2 Cycle—3 to 8 HP.**

**Standard the world over.**

**Reliable—Economical.**



6 to 8 H.P. Double Cylinder Model "U"  
Without Reverse Gear



This model "VM" Gray 4 cycle motor marks an epoch in Marine Motor history. In this motor is embodied the results of the most modern gasoline motor practice and backed by an old established motor building organization and its experience.

Slow Speed 500 to 600 Rev.—10 to 12 HP.	Medium Speed 700 to 900 Rev.—15 to 20 HP.	High Speed 1000 to 1200 Rev.—20 to 26 HP.
---	---	---

**Guaranteed for Work and Pleasure Boats**

## Gray 4<sup>Cycle</sup><sub>cylinder</sub> Motors

In three sizes 10 to 50 HP.

all valve-in-head

write today for 1920 literature

**Gray Motor Company**

**Detroit, Mich.**

**2106 Mack Avenue**

See Exhibit at New York and Boston Motor Boat Shows



# "GIBBS QUALITY"



A 77' Cruising Houseboat under construction in our Plant.

This boat will be equipped with every modern convenience and will be the "Last Word" in finish, equipment, and appointments.

## WHILE IN FLORIDA

You are invited to inspect work actually under construction at our Plant. "GIBBS QUALITY" starts with the first keel scarf and continues through every joint, fastening, seam, panel, mortise, and dovetail to the final rubbed finish on the most intricate and delicate piece of mahogany cabinet work.

SEE FOR YOURSELF, that "GIBBS QUALITY" is not merely skin deep.

SEE FOR YOURSELF, why every one who visits our plant remarks "it is *the most beautiful work I have ever seen.*"

SEE FOR YOURSELF, the largest and most completely equipped Yacht building and repair plant in the South.

We invite investigation. At your service for  
"QUALITY and EFFICIENCY"

## GIBBS GAS ENGINE COMPANY

JACKSONVILLE, FLORIDA

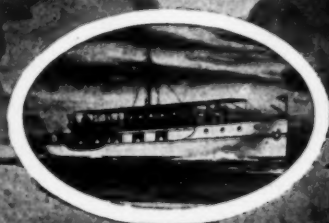
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# Mathis-Built Houseboats



## On to the Sunny Southland

THE ideal Winter is that spent cruising along the picturesque inland streams of Florida in a Mathis-built houseboat, of the latest 1920 perfected type. Go anywhere—and have comfort and cruising pleasures with you wherever you go.



## In Florida

now, in addition to 20 or 30 earlier built notable Mathis-built Houseboats, are the following latest 1920 type houseboats, just completed, which have shown remarkable sea-worthiness despite ice floes and winter storm on the trip down the coast:

- 52-ft. Bilma II, built by us for Mr. W. G. Selby, Tulsa, Oklahoma
- 52-ft. Loafalong, Mr. John C. King, New York City
- 52-ft. Riette II, Mr. George G. Shelton, Ridgefield, Conn.
- 52-ft. Scarus, Mr. John H. Eastwood, Bayshore, N. Y.
- 52-ft. Zigan, Mr. Edward S. Moore, Chicago, Ill.
- 52-ft. Helen Louise, ready for sale or charter
- 80-ft. Kingfisher, built by us for Mr. E. L. King, Daytona, Fla.
- 80-ft. Nadesah, Messrs. H. and D. H. Carstairs, Philadelphia
- 80-ft. Osana, Mr. Clayton G. Dixon, Philadelphia

## MATHIS YACHT BUILDING CO.

*Specialists in Houseboats and Cruisers  
from 40 to 120 feet*

COOPER'S POINT

CAMDEN, N. J.



**WISCONSIN'S**  
Connecting Rods are of the I-beam section type, drop-forged of 35% carbon steel and fitted with babbit lined bronze bushings on the crank shaft end and bronze bushings on the wrist pin end.



## Naturally It Costs More —Here's Why

The WISCONSIN Motor leaves our factory *finished*—every moving part adjusted—every bearing run-in—every cylinder ground accurately to size and every journal fitted perfectly.

The WISCONSIN Motor reaches the boat maker ready to install. And it reaches the boat owner ready to carry him one mile or a hundred, running cool, sweet and quiet. The name

*Wisconsin*  
CONSISTENT

is a guaranty of quality—an assurance that your motor will cost less in the end because it is *right* at the start.

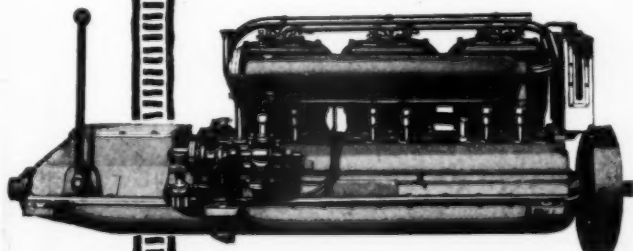
**Dealers:** Consider this when you are thinking about the expensive "service" costs.

**Boat Makers:** Compare the WISCONSIN'S slightly higher cost with the time of highly-paid men who frequently spend two or three days in your plant trying to make a lower-priced motor run properly.

**Boat Owners:** Remember you can't walk to a farmhouse and telephone for a tow when your engine balks far from shore. Isn't an engine that *you can depend* on worth a slightly higher price?

Metal costs every motor builder about the same, but it's the workmanship in a WISCONSIN that counts.

*Write for Specifications*



**WISCONSIN MOTOR MFG. CO.**  
Sta. A, Dept. 302 MILWAUKEE, WIS.

Distributors:

**NEW YORK BRANCH:**

T. M. Fenner, Factory Representative,  
21 Park Row, New York City

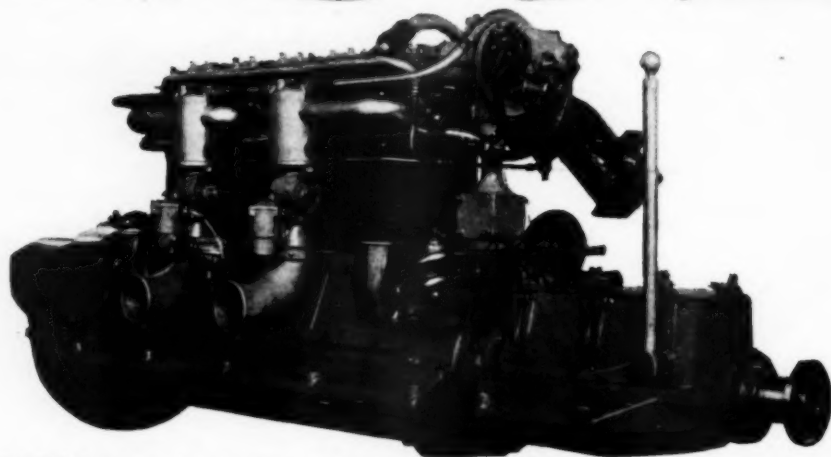
**CALIFORNIA DISTRIBUTOR:**

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**BE SURE TO SEE HALL-SCOTT MARINE MOTORS**

At the Motor Boat Show

**GRAND CENTRAL PALACE, NEW YORK CITY, FEBRUARY 20th-28th**

**Crankshaft** A seven bearing crankshaft of high grade chrome nickel steel drop forged, heat treated, machined and finished all over.

**Bearings** High grade nickel babbitt throughout, bronze backed, positively lubricated and of sufficient area to assure safe bearing loads.

**Overhead Valves** Operated by rock-er arms and overhead camshaft. Valves of large diameter and of high tungsten steel, so cooled as to eliminate distortion and warpage.

**Overhead Camshaft** Driven by gear on crankshaft through vertical shaft and bevel gears. Arms so designed to prevent oil leakage, and provided with simple and accessible tappet clearance adjustment.

**Crank Case** of high grade aluminum alloy, strongly ribbed. Upper half carries all main bearings and has exceptionally large hand hole plates on each side, enabling removal of the connecting rod and piston assembly without disassembling motor.

**Ignition** Delco Double Unit battery ignition, with two spark plugs in each cylinder.

**Starting & Lighting** Delco Two Unit. Starter has Bendix drive, and generator is directly driven off crankshaft.

**Reverse Gear** of the spur gear multiple disc type. Completely enclosed and readily removable.

**Pistons** of special aluminum alloy are carefully balanced and interchangeable.

**Connecting Rods** of chrome nickel steel drop forged, heat treated, and machined all over.

**Power** We have been specializing in the production of high-powered motors of minimum weight for more than ten years and are prepared to demonstrate that our motor has more power per cubic inch of cylinder capacity than any other marine motor on the market. Examine our power curve.

BUILT IN TWO SIZES ONLY—FOUR-CYLINDER 125 H.P.; SIX-CYLINDER 200 H.P.  
Write for copy of the new Hall-Scott Catalogue.

**HALL-SCOTT MOTOR CAR CO., INC.**  
BERKELEY, CALIFORNIA

Eastern Sales Office  
39 Associated Service Bldg., Buffalo, N. Y.



*Where There's Work to Be Done*

# HONEST CLAY

FOUR CYCLE

HEAVY DUTY

*Is The Engine You Want*

## *The Evolution of the Honest Clay*

More than twenty-two years ago, long before most marine engines known today were even thought of, a skilled mechanic built his first engine — not as a manufacturer seeking a profit, but as a creative genius seeking expression for his ideas. After the first engine he was asked to build another, and another and another, turning them out laboriously, painstakingly, honestly—each engine the product of individual workmanship. Thus was the Honest Clay born, built solely in response to a demand created by the sturdy reliability of the first Honest Clays.

Modern production or modern merchandising methods were unknown to the Clay builders of those days. An engine of merely ordinary quality could not have survived. But the Honest Clay was no ordinary engine, for its fame traveled and grew with no apparent effort. Its reputation was built on the solid rock of faithful performance.

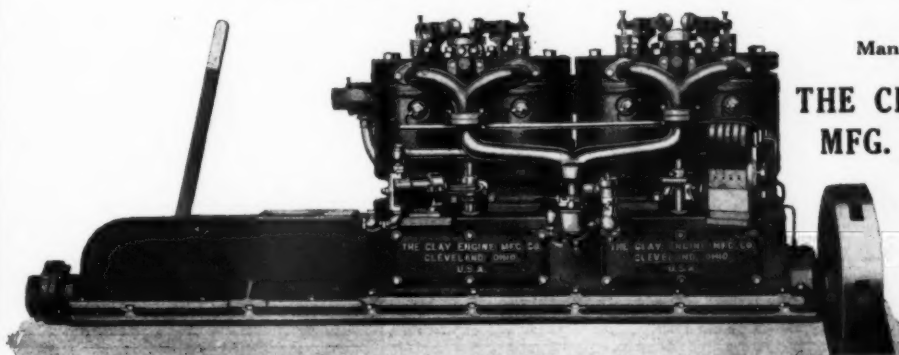
In the past few seasons a new organization has been developing the Honest Clay, retaining all the goodness of the former models, and adding to these the advantages of up-to-date manufacturing, new machinery, a well equipped plant and systematized production.

The culmination of this development and refinement is now offered in

### **The New HONEST CLAY Model "R"**

A new engine with an old name, and with all the rugged strength, stability and reliability **associated** with that name.

**SEE OUR EXHIBIT AT THE NEW YORK MOTOR BOAT SHOW**



Manufactured by

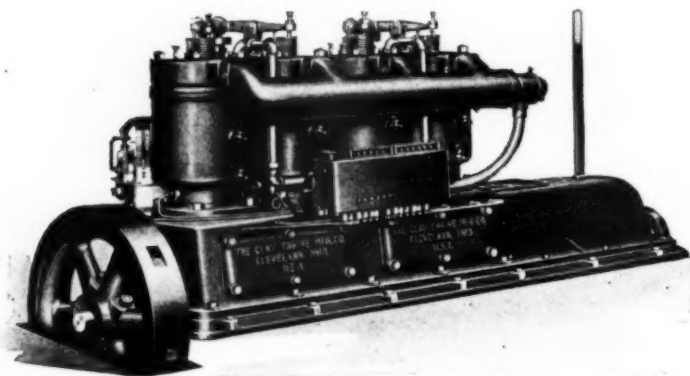
**THE CLAY ENGINE  
MFG. COMPANY**

664 East 72d St.  
**CLEVELAND  
OHIO**

**The New HONEST CLAY Model "R" Four Cylinder**

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## See the HONEST CLAY Model "R" at the New York Motor Boat Show



The new Model "R" HONEST CLAY line is exhibited for the first time at the New York Motor Boat Show. If you are interested in honest-to-goodness heavy duty work boat engines of any size from 6 H.P. up, don't fail to see and study these new engines.

The HONEST CLAY exhibit includes single cylinder, two cylinder and four cylinder engines of 8 H.P., 10 H.P., 12 H.P., 35 H.P., and 50 H.P. The 35 H.P. four cylinder engine is shown with Westinghouse Electric Starter equipment.

### THE MODEL "R" LINE

Single Cylinder,	6 H.P.,	8 H.P.,	10 H.P.
Two Cylinder,	12 H.P.,	16 H.P.,	20 H.P.
Four Cylinder,	25 H.P.,	35 H.P.,	50 H.P.

All HONEST CLAY engines are slow speed, four cycle, heavy duty type, built to outlast your hull and sturdy enough to run for as many hours as you please every day in the year, at minimum cost for fuel and maintenance.

Wherever the true values of real heavy duty engines are known—in Eastern harbors, on the Gulf, on the Pacific Coast and elsewhere throughout the world, HONEST CLAYS are recognized to be without an equal in their class.

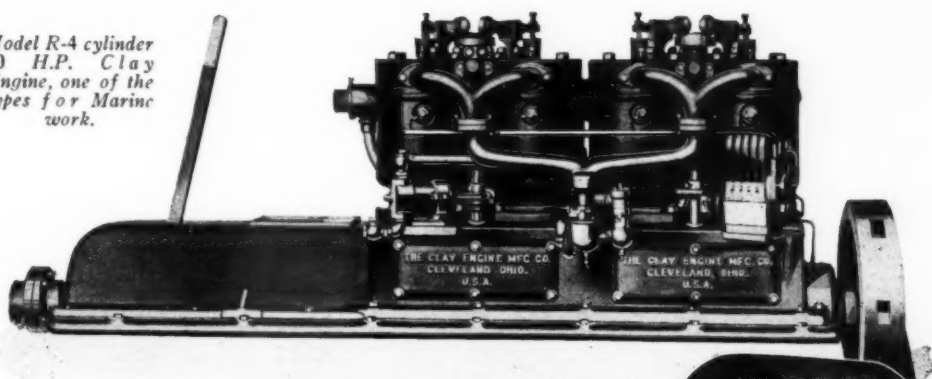
**FOR THE MAN WITH A HEAVILY BUILT BOAT,  
WHETHER PLEASURE OR COMMERCIAL**

*Ask us the name of our nearest agent*

**THE CLAY ENGINE MANUFACTURING COMPANY**

664 East 72d Street, Cleveland, Ohio

Model R-4 cylinder  
50 H.P. Clay  
Engine, one of the  
types for Marine  
work.

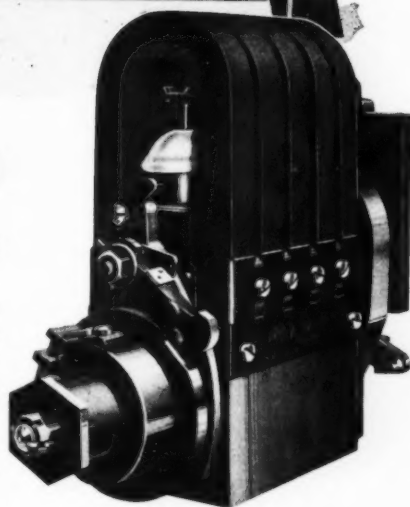


## Steady Ignition and Steady Performance

**I**N Clay heavy-duty Engines, the demand for steady, economical performance in marine work is answered. Similar to many other marine motors, the sturdy Clay Engines rely upon the consistent performance of the K-W Magneto for ignition—the life sparks of the engine's power. K-W Magnetos are built for such services as in marine work where there is a constant dead pull—where certainty of ignition means successful operation.

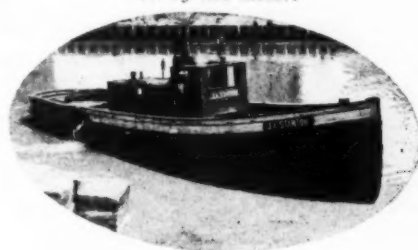
The K-W inductor principle eliminates all moving wires, commutators, sliding contacts and brushes. The K-W Magneto requires no attention outside of oiling and an occasional adjustment of the contact points in the breaker box. And, with the K-W, this box is easily removable without the use of tools.

K-W simplicity adds to Clay Engine simplicity.



Model HTK K-W Magneto  
used on Clay Engines.

The tug J. A. Stanton, Cleve-  
land, propelled by Clay Engine.  
An example of the hard service  
met by this motor.



THE **K-W** IGNITION CO.  
2903 CHESTER AVE. CLEVELAND, OHIO, U.S.A.



# Magneto

Fires any kind of Fuel—Gets Maximum Power from Every Drop

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# CLAY

*comes to*

# BETHLEHEM

*for Spark Plugs*



No. 88—Extra long  
1/2" extension Mica  
Spark Plugs, stand-  
ard equipment on  
Clay Engines.

THE Clay Engine Manufacturing Company, after exhaustive tests, has adopted Bethlehem Spark Plugs as standard equipment. Thus Quality goes hand-in-hand with Quality.

International Harvester, Marmon, Studebaker and 51 other manufacturers now look to Bethlehem for sure-fire spark plugs. And the list is growing daily.

The Bethlehem Spark Plug Corporation is just across the street from "Bethlehem Steel". The experience of the world's leading steelmakers is available to Bethlehem engineers.

An uninterrupted supply of steel for shells and alloys for electrodes is assured. A proved product, backed by ample capitalization, efficient management and national advertising, bespeaks the permanence of *Bethlehem Spark Plugs*.

This stability of Bethlehem is an asset to manufacturers, dealers and the public alike. 25,000 Bethlehem Spark Plugs a day, an ultra-modern factory and a close-welded service organization assure steady deliveries.

A request for more information entails no obligation.

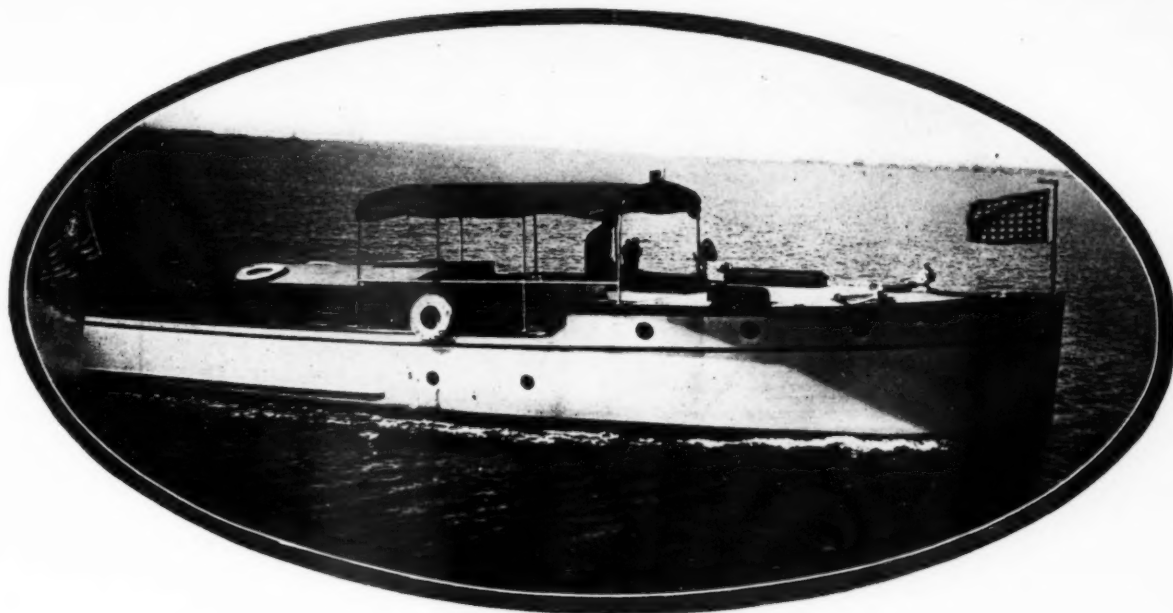
**BETHLEHEM SPARK PLUG CORPORATION**

E. H. Schwab, *President*  
Bethlehem, Pa.

*Bethlehem*

**SPARK  
PLUGS**





**Richardson**  
BOATS

Nothing but the best goes into a Richardson boat. Materials are selected with the greatest care. The best boat builders to be found are employed to construct them.

Your every requirement will be fulfilled in a boat built by us whether it's a fast runabout, cruiser, work boat, tug or commercial boat, we will build it for you at the lowest possible cost. Write us today for any information you require.

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K. D. frames or complete boat subject to your requirements.



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## *Trapshooting on the Forward Deck*



**H**ERE'S the New Sport for your summer boating parties. Trapshooting! It's a famous American Sport evolved and perfected by Americans.

The new Winchester Junior Trapshooting Outfit brings trapshooting right into your own cruiser. It's the new 1920 sport for cruising days.

The new .410 sport gun with the shells and "birds" and "trap" brings this fascinating pastime to you. No matter where you go, a royal sport is provided you. You can have the best times holding a shooting contest on your boat.

It's such a real joy to smash those flying clay "birds" into a thousand pieces as they sail over the water. You'll want to get in matches and tournaments. You'll want to keep the outfit on board along with the compass and sou'westers.

The new game is absolutely safe. The gun holds only one shell—no question as to whether it is loaded. It's inexpensive, too. Clay birds and ammunition can be procured at small cost. The sport gun and hand trap, with proper care, will last for years.

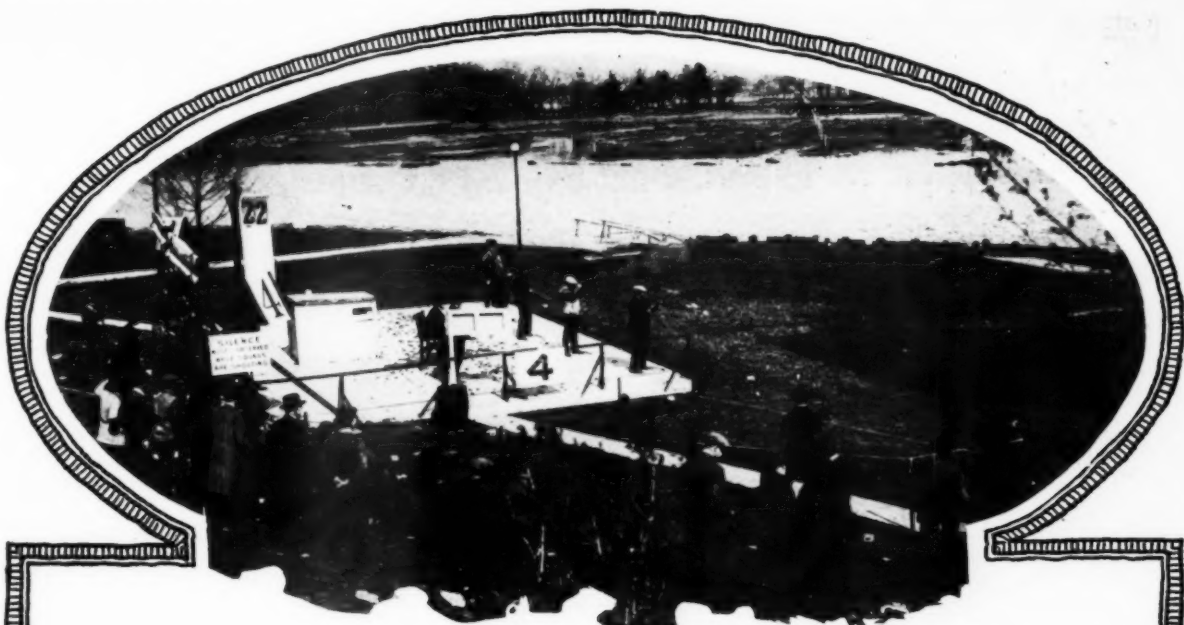
*This shows the Winchester Junior Trapshooting Outfit complete with the .410 gun, ammunition, clay "birds", and metal preparations all enclosed in a neat compact case.*



# **WINCHESTER**

## **World Standard Guns and Ammunition**

**WINCHESTER REPEATING ARMS COMPANY, NEW HAVEN, CONN.**



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## TRAPSHOOTING Afloat and Ashore

Get in this fascinating game! Hundreds of motor-boat owners are taking it up, shooting over their own club traps or from their own boats, using a hand trap. The thrill of shattering the clay birds as they sail out over the water will add keen zest to the leisure hours of the red-blooded yachtsman.

Plans for a Trapshooting League of Yacht Clubs are well under way and your club is invited to participate.

Go to the "Motor-Boating" Booth at the show and ask the Du Pont representative for details on organization, method and cost of installing traps, etc. If you don't get a chance to see him—

Write for full information to Military Sales Division, Promotion Section.

**E. I. DU PONT DE NEMOURS & CO.**  
Wilmington Delaware

*7 out of 10 shooters use*



**SMOKELESS SHOTGUN POWDERS**  
Fast burning, hard-hitting, close shooting.  
Standard Since 1802

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**S**ETS the standard for all reverse gears. Motor boats numbering more than 30,000 of all sizes and shapes are equipped with Standard Reverse Gears.

Being built for service these gears will outlast your boat.

A Standard Reverse Gear is strong, perfectly quiet, clean and trouble-proof—runs in oil and takes but little space in your boat.

If you want to know about the best reverse gear built—

*Write today for new  
catalogue and prices*



4 Sizes  
1 to 15  
H.P.  
per 150  
R.P.M.

## STANDARD GEAR COMPANY

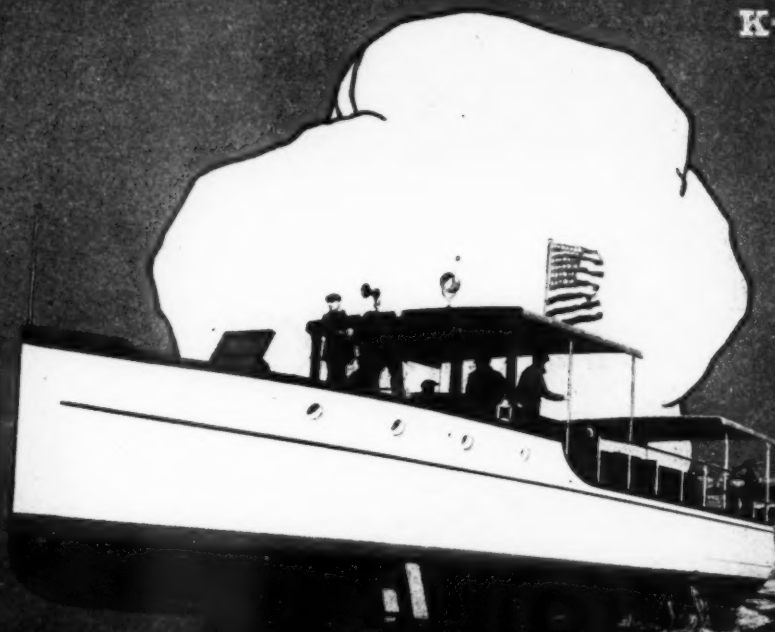
700 Commonwealth Avenue

DETROIT

MICHIGAN



"Over She Goes" *and* Finished  
Throughout  
*with*  
K-A-U-R-I



*(Pronounced Cowrie)*

## WATER PROOF SPAR VARNISH

Another proof to our claims that K-A-U-R-I waterproof spar varnish is used by discriminating boat designers, builders and owners.  
Raised Deck Cruiser "Galatea" 52'x11'—4x3'4".  
Designer—L. L. Kromholz  
Owner—Pierre L. Barbey, Tuxedo Park, N. Y.  
Builder—College Point Boat Corp.  
K-A-U-R-I is clear and transparent and guaranteed not to turn or scratch white or bloom.  
Changes of climate mean nothing to K-A-U-R-I.

Manufactured by

BROOKLYN VARNISH MFG. COMPANY

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The Most Complete Stock  
of Motor Boat Supplies in New York

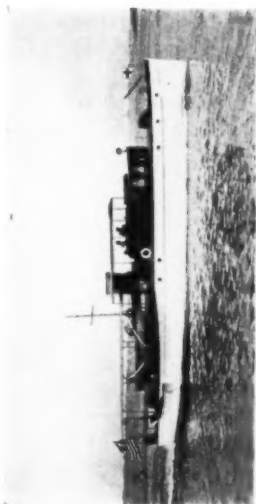
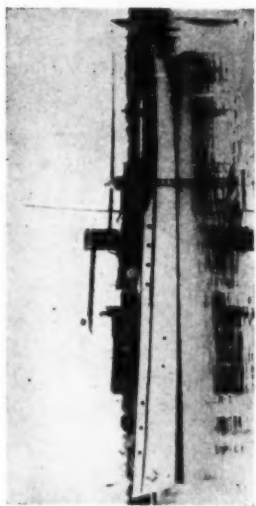
**"ZUNDEL HAS IT"**

**COME DOWN AND SEE US**

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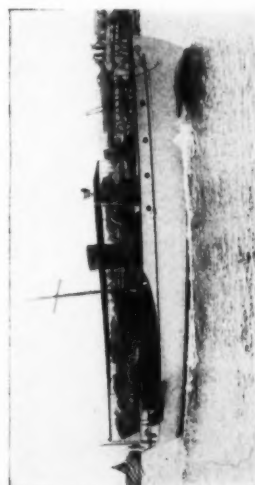
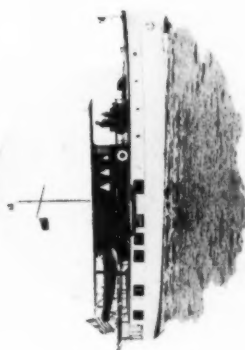
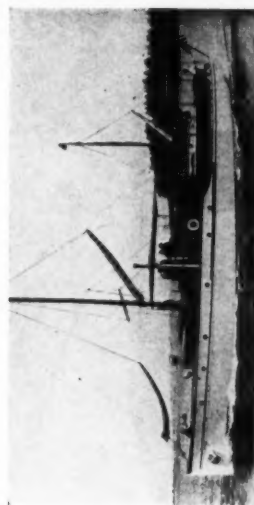


# Frederic S. Nock

## Naval Architect and Yacht Builder

### East Greenwich, Rhode Island

Some of the boats we have built

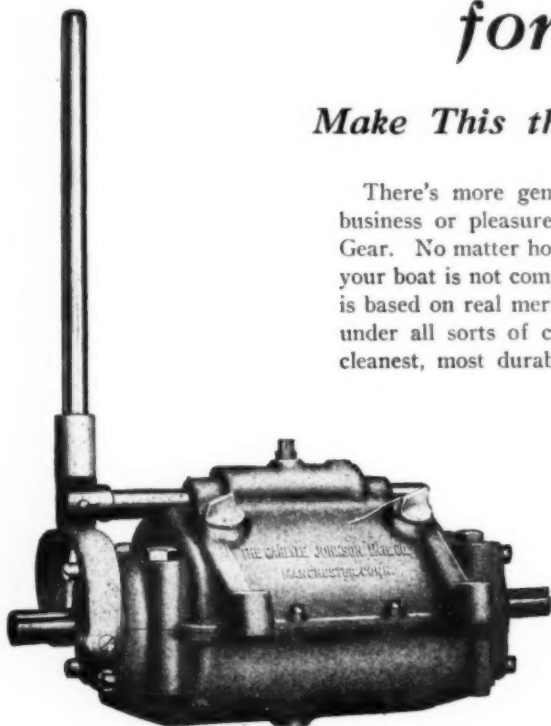


## THE JOHNSON MARINE REVERSE GEAR

### Put a Johnson Gear on Your List for 1920

#### Make This the Best Season Ever

There's more genuine satisfaction in boating, for business or pleasure, if you use a Johnson Reverse Gear. No matter how good the rest of the equipment, your boat is not complete without it. Johnson success is based on real merit—proven by actual performance under all sorts of conditions. The neatest, quietest, cleanest, most durable gear made.



#### "A worthy companion for the best of Motors"

Consider these features and think what they mean to you: powerful long-wearing clutches—special hardened alloy steel in all gears and shafting—equipped with radial and thrust ball-bearings made integral with the gear itself—the whole compactly enclosed in an oil tight case.

Look over the list of Johnson sizes below and select the gear for your boat.

See our exhibit at the National Motor Boat Show,  
Block K, Grand Central Palace, New York City.

Gear No.	H. P. per 100 R.P.M. Max.	H. P. for High Speed Motors Max.	Weight		List Price Cast Iron Case	List Price Aluminum Case	Min. Length Overall	Width Overall	Depth from Shaft Center	Height from Shaft Center	Shaft Diameter
			Cast Iron Case	Aluminum Case							
0	$\frac{1}{2}$	5	23	19	\$48.00	\$72.00	11 $\frac{1}{8}$	7 $\frac{3}{4}$	2 $\frac{1}{4}$	3 $\frac{1}{2}$	$\frac{5}{8}$
1	1	10	40	32	72.00	96.00	13 $\frac{1}{8}$	9 $\frac{1}{2}$	2 $\frac{1}{2}$	4 $\frac{1}{4}$	$\frac{7}{8}$
1A	1 $\frac{1}{2}$	15	70	55	84.00	108.00	16 $\frac{1}{8}$	10 $\frac{1}{8}$	3 $\frac{1}{4}$	4 $\frac{1}{2}$	1
2	3	30	93	75	96.00	120.00	18 $\frac{1}{8}$	11 $\frac{1}{8}$	3 $\frac{3}{4}$	5 $\frac{1}{8}$	1 $\frac{1}{8}$
3	5	50	248	211	144.00	180.00	24 $\frac{1}{8}$	16 $\frac{1}{4}$	5 $\frac{1}{8}$	7 $\frac{1}{8}$	1 $\frac{1}{2}$

Gear No. 5, now being developed—on display for the first time at the Motor Boat Show

Write Department 25 for full information.

**THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.**





ESTABLISHED  
**1850**

*For Seventy Years Ritchie  
Instruments have been the  
recognized Leaders in  
the Nautical Field*

This illustration shows our Octagonal and Hexagonal Skylight Deck Binnacle, with central electric cap and spare oil lamp and holder. Brass hood for night.

# RITCHIE



Mahogany Binnacle complete with compass, hinged cover, polished brass Kerosene Lamp. Compass can be removed instantly from the binnacle if desired. Compass sizes vary from 2½ inches to 8 inches. Your runabout cruiser or yacht is not properly equipped until Ritchie Instruments are installed.

Flat Card Compass, illustrated, has great magnetic force, making the compass much easier to adjust in iron ships. 2 in. to 10 in.

*Write today for your copy of our catalog.  
It contains the compass best suited  
for your boat.*



**E.S. RITCHIE & SONS**  
110 Cypress St. Brookline, Mass.

# THE Thomas Laughlin Co

## MARINE HARDWARE

The Trade Mark with



the Guarantee

Progressive Dealers all carry The Thomas Laughlin Co. line of Marine Hardware in iron and brass. Bronze Propellers, Ships' Telegraphs, Anchors, Tackle Blocks, Turn Buckles, Wire Rope Fittings, etc. Your dealer has Laughlin Co. Hardware.



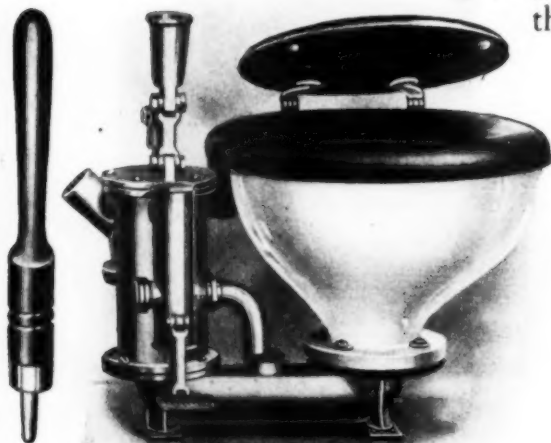
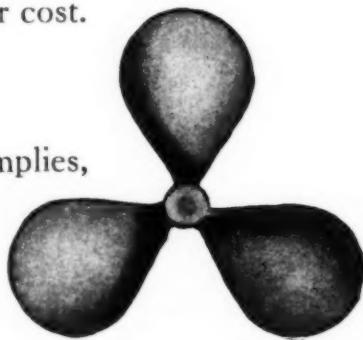
## "VAPO" MUFFLER and SILENCER

As in all other Thomas Laughlin Co. Supplies, the "Vapo" Muffler and Silencer carries our satisfaction or money back guarantee. All cast iron, nothing to wear out, comply with Harbor regulations, "Vapo" Mufflers are the most compact, efficient and durable your money can buy at double their cost.

### Propellers best in the country

*Guaranteed in every respect*

The famous "ECLIPSE" propellers, as the name implies, eclipse all others. Two blade and three blade, right hand or left hand, they are manufactured by us in three pitches.



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The most complete plant of its kind in the world for Drop Forging, Galvanizing, Blacksmithing, Pattern Making and Machine Work.

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THIMBLES — CLIPS — CLAMPS — TURNBUCKLES — SHACKLES

WIRE AND WIRE ROPE FOR EVERY PURPOSE

### INSULATED WIRES AND CABLES

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ARMORED  
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SPOT LIGHT WIRE

IGNITION CABLE

PRIMARY AND SECONDARY  
PLAIN, SINGLE OR DOUBLE BRAID

LAMP CORD

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WELDING WIRE

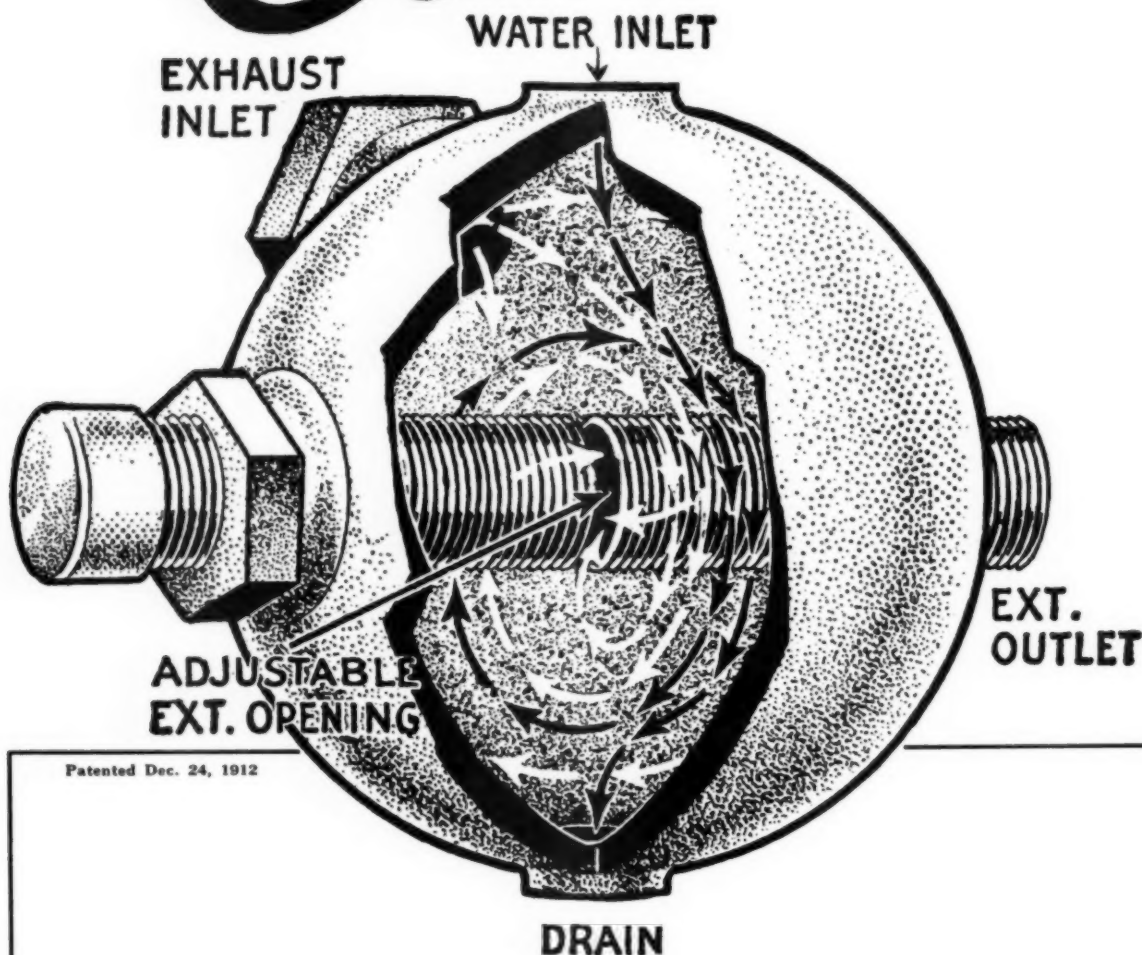
WIRE ROPE SLINGS

**John A. Roebling's Sons Company,**  
TRENTON, N. J.



New York Boston Chicago Philadelphia Pittsburgh Cleveland  
Atlanta San Francisco Los Angeles Seattle Portland, Ore.

# Silence



Patented Dec. 24, 1912

## Improved Thermex Silencer

THE law demands a silent exhaust. That means buying a genuine Improved Thermex Silencer, or else choking down your engine with back pressure, using more fuel, and all kinds of troubles.

The improved Thermex Silencer is the most efficient silencer ever devised. It has any number of good features, and no bad ones. It is the best silencer you can buy.

Increases revolutions.  
No back pressure.  
Cannot clog.  
Cannot collect salt.  
Water can't flow back to cylinder.  
No odor.

No heating.  
Used free or under water.  
Adjustable discharge.  
Lightest and most compact.  
Reduces fire risk.  
Cheapest to install.

Sizes from 1¼ to 3-inch exhaust pipe in stock.  
engines from 2 H.P. to 100 H.P., two or four cycle.

Larger sizes on order. Suitable for all

Write today for descriptive bulletin. Sold by the best dealers everywhere.

**CENTRAL MANUFACTURING CO.**

155 Liverpool Street

East Boston, Mass.



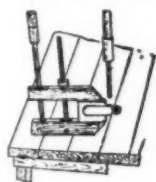


Emalco Boat Clamp

## EMALCO MARINE HARDWARE

RECOGNIZED AS THE BEST WHEREVER MARINE HARDWARE IS USED

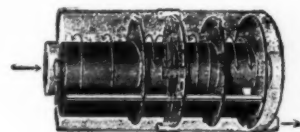
Emalco Boat Clamps are the best clamps it is possible to make. The illustration at the top of page shows its simplicity and strength of construction. All wedges and chains are eliminated when you plank with an Emalco Boat Clamp.



Emalco Universal Clamp

Emalco Universal Clamps are built for service. Set it in any position you wish—upright or lying down. Steel jaws with double thread for quick adjustment. Both screws swivel with jaws or work. Perfect Clamps are Emalco.

Maxim Silencers, used all over the world by reason of their dependability and conformity to the law, are a necessity. If you want the best, equip your boat with one.



Write today for EMALCO Catalog if you want the best hardware at the most reasonable price

# MALONE HARDWARE COMPANY

"WHERE THAT DOLLAR STRETCHES"

378 Atlantic Ave.

Near Rowe's Wharf

BOSTON, MASS.

When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating

# LUNKENHEIMER

## Automotive Accessories

Recognized by Builder and User as the true standard of excellence in the marine field

THEIR unfailing reliability, characteristic of all Lunkenheimer Products, is a contributing factor to the successful operation of Motor Craft everywhere.

Lunkenheimer Automotive Accessories perform the functions for which they are intended with a certainty that insures safe and economical operation, and the high quality materials used coupled with the Lunkenheimer method of manufacture means permanence and low maintenance cost.

In addition to the Accessories shown here a multitude of others are illustrated in our Catalog No. 4. Write for a copy.

Leading dealers everywhere sell Lunkenheimer Accessories. Specify and insist on having the genuine.

**THE LUNKENHEIMER CO.**  
"QUALITY"

Largest Manufacturers of  
High Grade Engineering Specialties  
in the World

**CINCINNATI**

New York

Chicago

Boston

London



Advertising Index will be found on page 208

*Sootless*  
spark plugs  
Just Won't Crack



*Sootless*

# The Big Brass Plug

*That Will Not Rust*

DO not tie up an expensive motor with a cheap spark plug. Sootless Spark Plugs cost more than some other plugs because they are worth more. They are hand-made, have sturdy brass jackets and mica insulation. All sizes for all motors. They cost \$1.50.

OAKES & DOW COMPANY  
308 Atlantic Avenue Boston, Massachusetts

*Sootless*  
SPARK PLUGS OUTLIVE THE BOAT

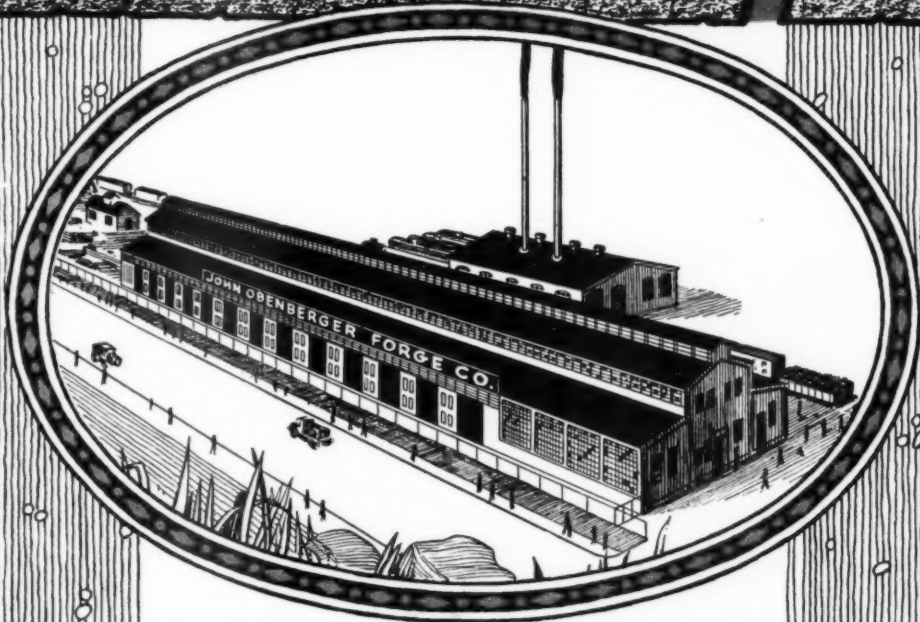


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# Obenberger



**S**ERVICE ever the basis of all our business transactions is the key note of Obenberger success.

In every branch of the Automotive industry Obenberger Forgings are in increasing demand.

From the receipt of your inquiry to the delivery of finished forgings, service and satisfaction are guaranteed.

**John Obenberger Forge Company**  
West Allis - - - Wisconsin



THE MARK THAT STANDS  
for  
OBENBERGER SERVICE



THE MARK THAT STANDS  
for  
OBENBERGER SERVICE

# Forgings



## Backing up the Promise to Serve With the Ability to Fulfil

During nearly half a century devoted to the production, manufacture and distribution of mahogany lumber and veneers, this company has built its wide clientele through backing up the promise to serve with the ability to fulfil the promise.

## Mahogany Lumber and Veneers

Today with all branches of the industry coordinated under one organization we are in better position to serve you than ever before.

### Astoria Mahogany Co., Inc.

347 Madison Avenue, New York

Successors to

Huddleston-Marsh Mahogany Co.

Astoria Veneer Mills and Dock Co.

F. W. Kirch, Inc.

Mills and Yards, Long Island City, New York

#### BRANCHES

44 North Market Avenue  
Grand Rapids, Mich.

2256 Lumber Street  
Chicago, Ill.

## What's Her Speed?

(Continued from page 9)

and enjoyed. It read "What was your eight o'clock position?"

We learned upon reaching port that some such answer as "Two hundred yards astern of you" was expected by the destroyer, but the chaser skipper had no reason for supposing that the question was put in jest and spent an uncomfortable fifteen minutes figuring up a position from dead reckoning. He eased his ruffled feelings a little later, however, by signalling that he was meeting with unexpected difficulties in his repair job and couldn't cast off the towline for another twenty-four hours. The day passed and the morning of the next, with the other chasers consuming hundreds of gallons of fuel and maintaining station as well as they were able; but the supposedly crippled craft held on to her towline until we were within sight of our destination, and not until then reported that her repairs were completed. When we were moored in port her commander announced with a fine show of pride that it was the best run he had ever made—"Gasoline consumption practically nil, engines in perfect condition, crew rested up to the point of laziness, and everything in readiness to start for the States at a minute's notice." But he would not admit in so many words that the break in his engine pump had been repaired two hours after the tow was taken. That was left to our suspicious imaginations.

When the chasers on foreign service cruised without escorting vessels their average speed varied from 9 to 10 knots. This may not be classified as phenomenal by any means, yet it eats up the miles in a twenty-four hours' run, and is equal to or a little better than the rate maintained by fully half of our new Shipping Board vessels. Ashore, an automobilist must average from twenty to twenty-five miles an hour to cover 240 miles in a day's run, and at the end of it he will know from the dust in his lungs and the strain in his muscles that he has been somewhere. Afloat, of course, the watches are divided among several, and the motors are not placed in a garage overnight. But the comparison serves to bear out my contention that four degrees of latitude is a considerable bite out of the earth's surface.

Traveling at 10-knot speed the chasers were able to keep up nicely on two motors without exerting them to full capacity, and, having three power installations to choose from, their commanders were able to operate the two whose screws were least affected by the prevailing sea; or they could put out of commission immediately any motor that showed symptoms of trouble. With three motors in operation a 10-knot speed could be held at a loafing gait, and the engineer's force could read their Wild West magazines or gaze out of the ports at the restless waters without interruption. But the fuel consumption was high out of proportion to the results attained, and in ordinary circumstances it was customary with us to disconnect the center motor from its propeller shaft and proceed on the wings.

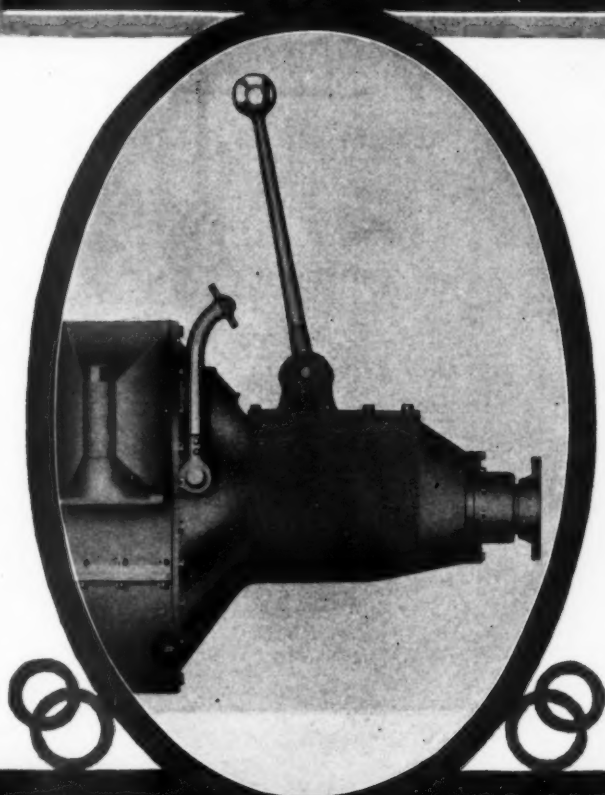
The prevailing custom of overrating the speed of the chasers must have originated with the newspapers, for the daily press never let slip an opportunity to refer to the 110-footers as speed marvels. When the Bermuda-New York race was run last August one paper spoke of the winner's "dash" into port and bubbled over for the better part of a paragraph in this fashion: "The figures announced unofficially by the Navy Department point to the most remarkable feat ever performed by a Navy vessel in tearing down time records. The tiny craft and its sister ships dauntlessly breasted tumbling seas which kept their decks awash from start to finish of the race." It was my opinion at the time of the race (and I still hold it) that the speed of 11.6 knots which the S. C. 131 averaged on the 680-mile course between St. David's Head and New York was something of which any motor boatman could feel proud. But I'd have to row a wherry against a three-knot tide a great many days before my sense for values had so changed that I could consider 11.6 knots an unusually high speed.

That race which the 131 put up against five other contestants gives us a good basis to work from in forming an estimate of chaser speed. The other chasers which competed between Bermuda and New York were selected because they had shown their ability in many a run between European ports; the 131 was counted in at the last minute for what, to avoid a lengthy explanation, might be termed equitable reasons. But by the skilled management of her commanding officer, Lieutenant Day, and the engineering efficiency of our machinist's mates, we plugged along at a speed varying between 10½ and 12½ knots and worsted our fast competitors by a handy margin. No greater speed could be kept up for three days without approaching perilously close to a gasoline famine in the tanks.

Indeed, if the chasers had habitually traveled at their top speed while in foreign waters the war might have ended with disastrous results from shortage of gasoline; for as the pace went up the fuel consumption sky-rocketed out of sight. As an illustration of this, we once covered 50 miles at 13-knots speed, working three motors nearly up to capacity, and in that

(Continued on page 200)

# J. V. B.



**H**OW many automobiles still use the old fashioned planetary type of transmission? Why did they change to the sliding gear type?

Answer those questions and you know why Jos. Van Blerck equips the J. V. B. engine with a sliding gear transmission type of reverse gear and thus shocks the whole Marine Engine Industry into violent argument pro and con.

It was Jos. Van Blerck who was first to put a pressure oiling system in a big marine engine — they laughed at him, then copied him.

It was Jos. Van Blerck who first enclosed the reverse gear on high speed marine engines — again they laughed and again they copied him.

Jos. Van Blerck states that a sliding gear transmission type of reverse gear is *THE* best thing for marine engines and backs his judgement and knowledge by putting one on his latest creation — the J. V. B. engine.

With it you slide into high, into neutral, into reverse just as easily, just as quietly as in your car. Its so simple, so efficient.

And it works! Ask for the proof.

**THE J. V. B. ENGINE COMPANY-AKRON, OHIO, U. S. A.**

**EASTERN SALES OFFICES: -1778 BROADWAY, NEW YORK CITY**

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# TILLINGHAST'S RACING GREEN



## "PROVED BY TEST"

### "Always a Clean, Polished Racing Bottom"

After ten years trial Mr. Robert Jacob (Ship and Yacht Builder) City Island, N. Y., and others pronounce

## TILLINGHAST'S RACING GREEN

the best ever produced

"It is the only Anti-Fouling Paint in the world. Keeps the bottoms of Yachts, Motor Boats and other craft, wood or steel, free of grass, barnacles, worms—insuring a clean, polished bottom, always ready to race."

List of Shipyards using Tillinghast's Racing Green

#### CONSOLIDATED SHIPBUILDING CORPORATION, Morris Heights, N. Y.

James Fyfe, Glenwood, Long Island

Robert Jacob, City Island, N. Y.

Kyle & Purdy, City Island, N. Y.

Luder's Marine Construction Co., Stamford, Conn.

New York Yacht, Launch & Engine Co., Morris Heights, N. Y.

Henry B. Nevins, City Island, N. Y.

B. Frank Wood, City Island, N. Y.

## TILLINGHAST PRODUCTS CORPORATION

299 BROADWAY

NEW YORK





# TOPPING BROTHERS

MARINE HARDWARE  
OF EVERY DESCRIPTION

Shipbuilding Supplies

Cabin Hardware

Cargo, Boom and Mast Fittings

PORT LIGHTS, ALL DESIGNS AND SIZES

Calking Irons  
Ship Augers  
Anchors

Treenail Augers  
Brass Bolts  
Ship Clamps

Anchor & Sailing Lights  
Ship Scrapers  
Rowlocks

CLEATS

Cast Iron  
Galvanized  
Brass

ROPE

Wire  
Manila  
Tiller

THIMBLES

Wire Rope  
Sail  
Brass

ANCHORS

Loose Stock  
Trawl  
Folding

CHAIN  
SHACKLES

BLOCKS

Mall, Iron  
Deck  
Yacht

Mast Hoops  
Boat Hooks  
Life Preservers

Deck Plates  
Rudders

Clinch Rings  
Turnbuckles  
Quadrants

HARTHAN PROPELLERS

Hawse Pipes  
Fenders  
Bilge Pumps  
Pitch

Chain Hooks  
Eye Bolts  
Snap Hooks

Bow Chocks  
Stern Chocks  
Boat Nails  
Marine Engines and  
Equipment

SHIP CARPENTERS' TOOLS

## TOPPING BROTHERS

ESTABLISHED 1885

122 CHAMBERS ST NEW YORK

\*\*\*\*\* Quality, Not Price \*\*\*\*\*

The advertisers who are grouped in this insert have taken the space in our interest and at our suggestion as an effective way of bringing their product before the Motor Boat and Shipbuilding World, Builders, Dealers and Owners.

We wish to call attention to their products.

**Allison & Company.**

The Allison Anchor made in all sizes to hold a motor boat or an ocean liner. These anchors are of patented construction, which gives the greatest strength and holding power.

**American Chain Company**

The American Chain Company are the world's largest manufacturers of chain. They make chain suitable for every marine purpose. All types, sizes and finishes—from the smallest tiller chain to the largest stud link anchor chain for battleships and ocean liners.

They maintain an experimental department which is constantly on the alert to increase the efficiency of their product, exhaustive tests being at all times carried on in their own rolling mills to develop the material which makes every link of every ACCO CHAIN hold for the purpose intended.

We stock and have made to order special sling chains, mooring chains, galvanized and plain anchor chains, tiller chain, in fact, chain for every marine purpose manufactured by the American Chain Company.

**American Sailmaking Corporation.**

Canvas and Rope work of all kinds, Sails, Awnings, Covers.

**Atlantic-Pacific Mfg. Company.**

Manufacturers of Life Preservers, Spray Hoods, Ring Buoys, Fenders, Cushions, Life-Saving Equipment, all of latest design and conforming to Government requirements.

**The Barker Factory.**

Manufacturers of one of the oldest and most reliable two cycle marine motors.

**Delaware Marine Mfg. Company.**

Makers of Airports and Fixed Lights. They have the finest designs and their models are standard with all Government departments and shipyards. Their factory capacity on airports alone is not equaled.

**C. Drew & Company.**

have made shipyard tools since 1837. Their name stands for the highest grade—a reputation which they have constantly maintained. A professional caulker will use no other maker's tools.

**Industrial Pitch & Tar Products Inc.**

One of the most difficult things to obtain about a boat is a satisfactory pitch for the deck seams. It must not be soft enough to run in hot weather or so brittle as to chip and crack out of the seam in cold weather, and must always be ductile to follow the swelling and contracting of the wood. It takes experience in blending to produce the proper pitch and Industrial knows from experience.

**The E. J. List Manufacturing Company.**

A satisfactory light clutch coupling and a practical shaft log for light engines and boats are two things that owners and builders have always wanted. The List clutch and shaft log fill the bill to perfection and are in a class by themselves.

**The McFarland Foundry & Machine Company.**

Makers of the original Harthan Propeller. This propeller has been copied by almost every other maker. The reason is that the Harthan delivers the power and speed and has the balance that does away with vibration. Their universal joints and pillow blocks are the most simple and useful of their kind.

\*\*\*\*\* Stocked in New York by TOPPING BROTHERS \*\*\*\*\*

Advertising Index will be found on page 208

\*\*\*\*\* Quality, Not Price \*\*\*\*\*

### National Marine Lamp Co.

They are the oldest and largest makers of Marine and Signal Lanterns. Their line covers all styles and sizes both kerosene and electric for every marine purpose.

### The Wm. H. Otto Metal Goods Corp.

Makers of pressure kerosene and gasoline stoves. Their designs follow the well known Swedish system which has given satisfaction for years. They are the quickest, safest, most efficient and least trouble of any small stove.

### Western Block Company.

The Western Block Company is one of the oldest and largest manufacturers of blocks in the country. There is hardly a use for a block that the Western Block Company hasn't a type for the purpose—blocks for manila rope, and wire rope—blocks for sails or cargo—sheaves—mast trucks, dead eyes, lizards.

### Wilcox-Crittenden & Co.

For over sixty years the name Wilcox-Crittenden & Company has stood for the finest galvanized and brass marine hardware. Their equipment is second to none and their pride is their reputation for quality.

Topping Brothers carry complete stocks of all of the above, also thousands of other items, always ready for immediate delivery or shipment in practically any size or quantity from our own warehouses in New York. We number among our regular customers the largest shipbuilders in New York and vicinity, as well as in other parts of the United States and throughout the world.

We solicit your inquiries.

## TOPPING BROTHERS

122 Chambers Street

New York City

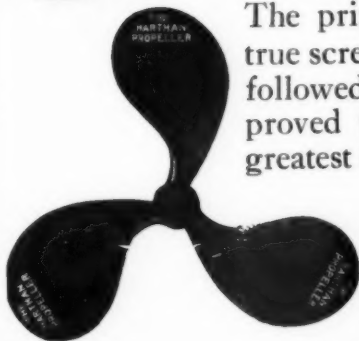
Cuban Office: Bank of Canada Bldg., Havana.

# The Genuine HARTHAN Propellers



Made from 10 to 30" in 2 Blade Bronze, and 10 to 50" in 3 Blade Bronze.

The composition of the metal is very tough, which allows a thin blade with sharp edges and a high finish. The principle of a true screw is strictly followed, which has proved to give the greatest efficiency.



### "PERFECT"

Adjustable Universal Joints. Simple Durable Interchangeable Hubs bored and fitted with standard keyways.



### Pillow Blocks

Single adjustable ball and socket type Babbitted. Can be installed without removing shaft.



**McFarland Foundry & Machine Company**  
Trenton, N. J.

TOPPING BROTHERS, Agents

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# AMSAILCO

YACHT SAILS  
BOAT SAILS  
WIND SAILS  
SAIL COVERS  
BOAT COVERS  
ROPE LADDERS  
ROPE NETTING  
SEA ANCHORS  
COCOA MATTING  
BALLAST BAGS  
ENGINE COVERS  
BINNACLE COVERS  
WINDLASS COVERS  
TELEGRAPH  
COVERS  
FLAGS



AWNINGS  
WEATHER  
CURTAINS  
DODGERS  
SPRAY HOODS  
CANOPYS  
ROPE FENDERS  
CANVAS FENDERS  
HAMMOCKS  
TARPAULINS  
COT BOTTOMS  
SKYLIGHT COVERS  
WHEEL COVERS  
VENTILATOR CAPS  
SEARCH-LIGHT  
COVERS  
COTTON DUCK

## Why Amsailco Supersedes

OUR PRODUCTS ARE MANUFACTURED OF THE BEST MATERIAL OBTAINABLE, IN A PLANT WHERE EFFICIENCY AND SERVICE SUPERSEDE.

## AMERICAN SAILMAKING CORPORATION

49-51 FULTON STREET

Telephone Main 605

BROOKLYN, N. Y.

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Advertising Index will be found on page 208



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# ALLISON

## ALLISON STOCKLESS ANCHOR

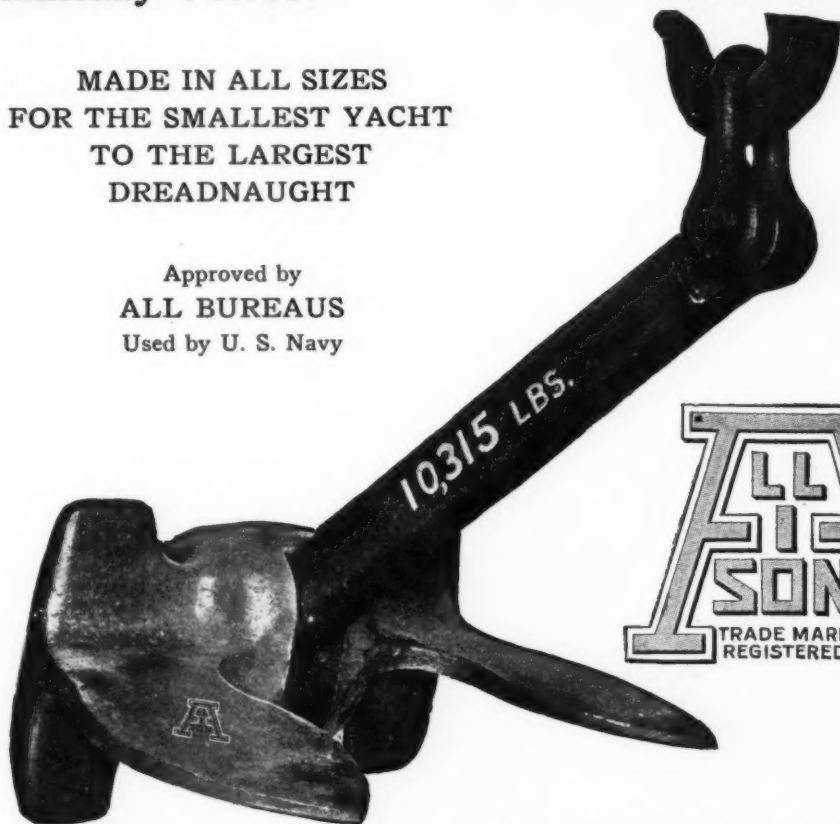
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**Mechanically Perfect**

**Takes Hold at Once**

MADE IN ALL SIZES  
FOR THE SMALLEST YACHT  
TO THE LARGEST  
DREADNAUGHT

Approved by  
ALL BUREAUS  
Used by U. S. Navy



**"Strongest and Most Reliable"**

Catalogue on request

Manufactured by

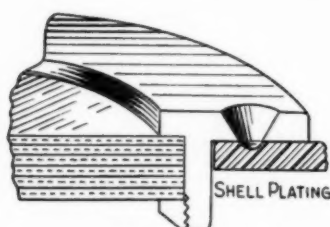
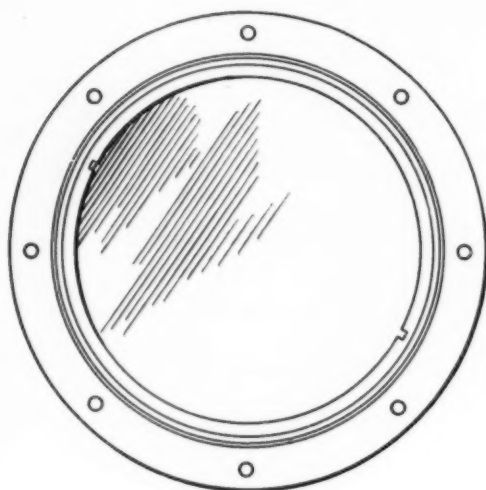
**ALLISON AND COMPANY**

# CHESTER·PA·

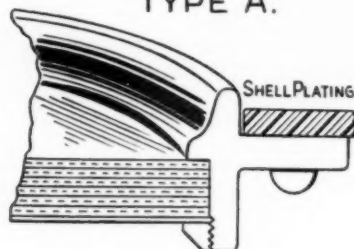
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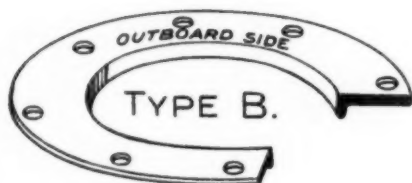
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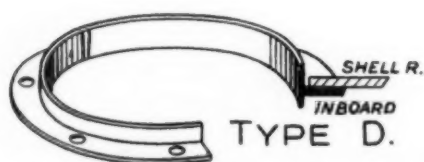
TYPE A.



TYPE B.



FOR WOODEN VESSEL FITTED  
ON OUTBOARD SIDE



FOR STEEL HULL OR  
DECK HOUSES

## Our Specialty—

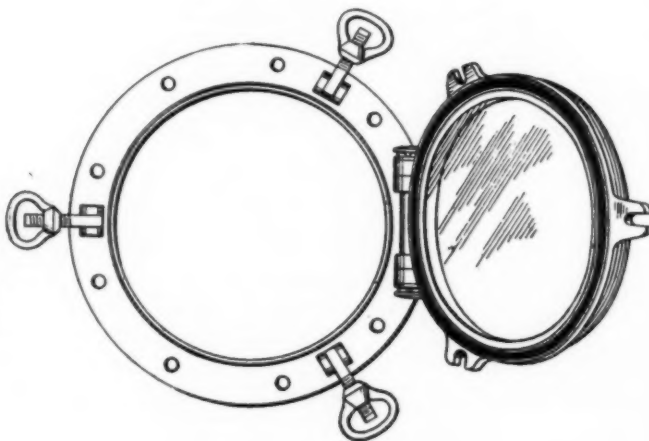
AIR PORTS  
FIXED LIGHTS  
DECK LIGHTS

For Every Class of Craft from  
Motor Boat to Battleship

*Manufacturers of above for the past seventeen years*

**Delaware Marine  
Manufacturing Co.**

Wilmington, Delaware



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Advertising Index will be found on page 208

Quality, Not Price

# SPRAY HOODS



Monarch Sliding Type  
Frames—Made of hard brass  
tubing, all fixtures of solid brass.

Covering—Made of 8 oz. or 10  
oz. U. S. Standard Army Khaki.

**For the Open Launch** with a cock pit not over 6 feet wide, the "Monarch" sliding type of spray hood as illustrated above is the most practical and convenient hood on the market. For larger boats see our "Commodore" spray hoods.

**To Set this Hood** simply raise the last bow, pull the carrier backward on slide and the rest of hood will follow automatically. Button one grommet on each side of hood to side of coaming, and hood is ready for service.

**To Collapse** Release the two grommets on side of coaming, push carriers forward on slides and hood will drop, making a neat furl around the forward end of coaming. Either operation can be done by one man in ten seconds. OPERATION POSITIVE.

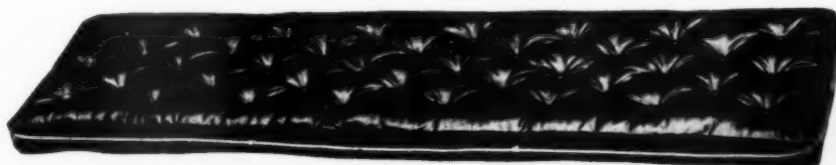
**Single Hoods** in any length from 4 ft. to 9 ft.

**Hoods and Aprons** A hood for forward end with an apron for stern end makes a complete night cover. This apron goes over the last bow of hood, overlapping it and fastened by means of hooks that are attached to rings sewed in hood. At bottom of apron we put in grommets to button on outside of coaming.

**Double Hoods** For covering the entire cockpit, select two hoods, of suitable length to cover full length of cockpit, one of which will fold on forward deck and the other on aft, overlapping one another in centre, making a complete night cover. Each hood can be used independent of the other.

**Catalogue** with measuring blank on request.

## ACME LIFE-PRESERVER CUSHIONS



**Prime Java Kapok** Cushions filled with Prime Java Kapok serve a double purpose; use them anywhere about a boat as ordinary cushions, and in time of emergency as Life Preservers. They are luxuriously comfortable cushions and life preservers combined, and when of sufficient thickness are as comfortable to sleep on as hair mattresses.

**Covering** The Covering is made of any material and color desired. We quote prices on 10 oz. Khaki or Brown Duck, the best Artificial leather and English corduroy. Samples for covering on request. Workmanship is the very best, all seams have a corded welt and are guaranteed not to rip. Non-corrosive tufting buttons to match material.

**Send For** COMPLETE CATALOGUE of all types of SPRAY HOODS, CUSHIONS, MATTRESSES AND PILLOWS—CORK LIFE PRESERVERS, RING BUOYS, U. S. Government Inspected and Passed—MOORING BUOYS, FENDERS, etc.

### ATLANTIC-PACIFIC MFG. CO.

124-128 Atlantic Ave., Thru to 121-125 Pacific Street

Brooklyn, N. Y.

Stocked in New York by TOPPING BROTHERS

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# AMERICAN CHAIN

## BRIDGEPORT,

General Sales Office:  
Grand Central Terminal  
New York City

In Canada—Dominion Chain

**Largest Manufacturers**



TRADE MARK

REG. U.S. PAT. OFF.

*Advertising Index will be found on page 208*



## Where Strength Means Safety

A storm-tossed sea—a giant liner crowded to the rails with panic-stricken humanity—and the only thing between the rock bound coast and eternity—an ACCO CHAIN—*and it held.*

At such nerve racking times you can't blame people for asking—will the captain fail us? Will the anchor chains hold?

In the hour of peril, you can't measure human life nor human suffering in dollars and cents.

Ocean travel demands SAFETY.

Before a seaman can secure a pilot's license he must pass the examiner's test. Before an ACCO CHAIN can get a "commission" it must prove its STRENGTH—every link must test up to its rated capacity to make SAFETY ABSOLUTE.

ACCO CHAINS are tested with the largest and most modern type of chain tester in the world.

You can stake your last dollar that every link in each chain we make will HOLD for the purpose intended. And we make chains for every known requirement from Plumbers' Safety Chain to Ships' Anchor Chain—all Sizes, styles and finishes.

# COMPANY, Incorporated

## CONNECTICUT

Co. Ltd., Niagara Falls, Ontario

of Chain in the World

DISTRICT SALES OFFICES  
 Boston Chicago  
 Philadelphia Pittsburgh  
 Portland, Ore. San Francisco



TRADE MARK

REG. U.S. PAT. OFF.

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Quality, Not Price

SHIP CAULKERS' TOOLS

DREW

SHIPBUILDERS' TOOLS

Est.  
1837**C. DREW & CO.** KINGSTON  
MASS.

MANUFACTURERS of SUPERIOR QUALITY TOOLS

*Acknowledged the Best.**Ask the User*

CAULKING IRONS  
CAULKING MALLETS  
HAWGING IRONS  
HAWGING MALLETS  
TREENAIL AUGERS  
SET AUGERS  
BOOM AUGERS  
MARLINE SPIKES

COOPERS' TOOLS  
COLD CHISELS  
BOX CHISELS  
BOX SCRAPERS  
COPPERING HAMMERS  
MASONS' HAMMERS  
COTTON HOOKS  
BOX HOOKS  
HAY HOOKS

TOPPING BROTHERS, Agents, 122 Chambers St., New York

Carry a Stock of Drew's Goods and Can Make Quick Deliveries

COOPERS' TOOLS

DREW

MASONS' TOOLS



## Running and Signal Lights—

OIL OR ELECTRIC

A partial list of our lines includes Combined Lights, Three-way Combination Lights, Sailing Lights, Stern and Anchor Lights, Bow and Side Lights, Fancy Brass Sets, Regulation Pier Lights, Drawbridge and Loft Bridge Lights, Special Trap, Stake and Post Lights, Ferry Boat Side Lights, Pilot House Lights, Deck Lanterns, Binnacle Lights, Station Lamps, Cabin Lights, Battery Lamps and Sets, Etc.

Manufactured by

**National Marine Lamp Company**

Forrestville, Conn.

New York City, N. Y.



Stocked in New York by TOPPING BROTHERS

Advertising Index will be found on page 208

\*\*\*\*\* Quality, Not Price \*\*\*\*\*

Cable Address, "INDPITAR"

# Industrial Pitch & Tar Products, Inc.

MANUFACTURERS

BROOKLYN, N. Y.

## OFFICE:

985 WYCKOFF AVENUE

Telephone, Evergreen 2006

## FACTORY AND YARDS:

Halsey Street, Wyckoff Avenue and

L. I. R. R. Tracks.

## SHIP PITCH

### PITCH

In Bags, Barrels or Special Packages.

Brewers, Bergundy, Coal Tar, Ship, Pine, Rosin, Vegetable, Hardwood, Mineral and Gilsonite.

### OILS

In Barrels, Drums or Cans

Coal Tar, Pine Tar, Cresote, Pine, Rosin, Disinfectant, Crude Carbolic, Pine Flotation and Coal Tar Flotation.

### SOLVENTS

In Barrels, Drums or Cans.

Benzol, Toluol, Xylol, Solvent Naphtha, Cresylic Acid, Carbolic Acid, Wood Turpentine and Pine Oils.

### DISINFECTANTS

In Barrels, Drums or Cans.

Coal Tar, Pine and Cresol.

### ROOFING MATERIALS

Paper, Felt, Pitch, Coal Tar, Dead Oils, Cements, Black Paints.

### ROSIN—All Grades

In Bags, Barrels or Special Packages.

### TAR

In Barrels, Drums or Cans

Pine, Coal, Candle, Vegetable, Mineral and Hardwood.

Selling Agents for the Metropolitan District.

**TOPPING BROS.**

122 CHAMBERS STREET

NEW YORK CITY

\*\*\*\*\* Stocked in New York by TOPPING BROTHERS \*\*\*\*\*

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\*\*\*\*\* Quality, Not Price \*\*\*\*\*

## Water Soaked Shaftlogs Decrease Motor Boat's Power

Our metal adjustable shaftlog is placed inside the hull, using rubber gasket; stuffing box is also supplied with rubber gasket, thereby insuring a perfectly watertight installation; is easily adjustable to any angle desired. Easily installed in new or old boats.



The only shaftlog constructed to carry a sleeve which prevents moss or weeds from wrapping around shaft stalling the engine. The many advantages together with the low price is making this log very popular.

### Made in Five Sizes

No. 1 Maximum Bore  $\frac{5}{8}$ "      No. 3 Maximum Bore  $1\frac{3}{8}$ "  
 No. 2 Maximum Bore 1"      No. 3A Maximum Bore  $\frac{1}{2}$ "  
 No. 4 Maximum Bore 2"

Made in Grey Iron, Bronze or Aluminum.

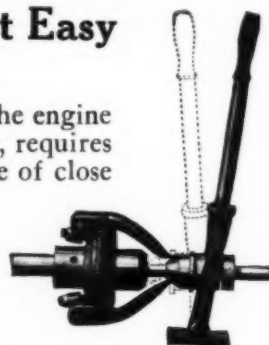
These logs are furnished complete with housing, stuffing box and gaskets at the above prices.

## Your Hard-to-Start Engines Will Start Easy

If equipped with our double grip clutch couplings.

A combination coupling and one way clutch connects the engine and propeller shaft as firmly as a sleeve or flanged coupling, requires no foundation, easily installed, requires small space. Made of close grained grey iron, will last longer than engine.

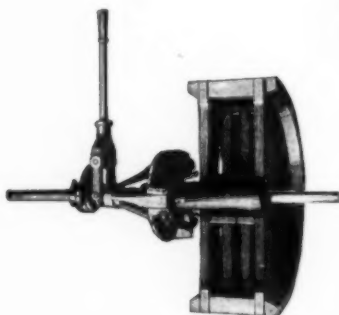
This clutch stands paramount among motor boat accessories and is making large and increasing sales daily because of its many advantages and low price. Send diameter of engine and propeller shaft and width of keyways. Made in six sizes.



Pulley Clutches, Line Shaft Clutch Couplings, Double Clutches, Marine Oneway Clutch Couplings, Metal Adjustable Shaftlogs and Propeller Wheels

### CLUTCHES THAT CLUTCH

#### Famous Positive Grip Marine Clutch Couplings



No.	Diam.	Wt.	Max. Bore	H. P. Per 100 Revol.	Max. Size Propeller
1	4 in.	5 Lbs.	1 in.	$1\frac{1}{4}$	11 in.
1-A	5 in.	12 Lbs.	$1\frac{1}{2}$ in.	2	13 in.
2	6 in.	14 Lbs.	$1\frac{1}{2}$ in.	$3\frac{1}{2}$	15 in.
3	9 in.	25 Lbs.	2 in.	$10\frac{3}{4}$	20 in.
4	12 in.	45 Lbs.	$2\frac{1}{4}$ in.	23	28 in.
5	15 in.	90 Lbs.	$3\frac{1}{4}$ in.	46	36 in.

The prices on the above are lower than are offered on any other equipment for the same purposes. Send inquiries to Topping Brothers.

# THE E. J. LIST MFG. CO.

HAVANA

Waterfront between Main and Adams Sts.

ILLINOIS

Stocked in New York by TOPPING BROTHERS

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Quality, Not Price

**PRESSURE  
OIL**



**KEROSENE  
STOVES**

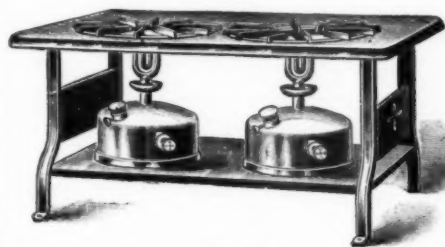
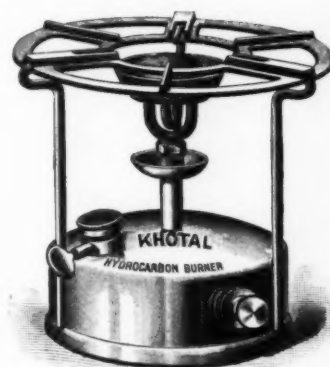
## *For Marine and Camp Use*

### The Ideal Stove for Small Boats

Height ..... 8 inches  
Diameter, Top .....  $8\frac{3}{4}$  "  
Diameter, Base .....  $6\frac{3}{4}$  "

This is the "Khotal" Hydrocarbon Burner with Non-detachable Standards.

For motor and sail boats, camping or general use where a small and compact stove is wanted.



No. 401

The following are specially galvanized to withstand the action of salt air:

No. 401 Galvanized Sheet Steel, fitted with two 1-quart stoves. Height 12", Top 12x22", Base 12x22".

No. 402 Same with Rail.

No. 404 Galvanized Sheet Steel, fitted with two 3-quart stoves. Height 12", Top 12x22", Base 12x22".

No. 405 Same with Rail.

### ROYAL BLUE, also made in one and three burners and with rail

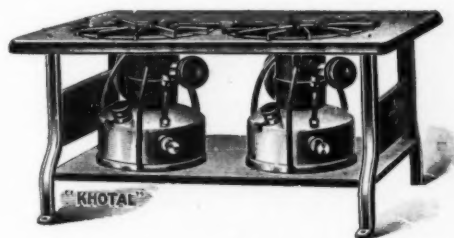
The following are specially galvanized to withstand the action of salt air:

No. 241 Galvanized Sheet Steel, fitted with two 1-quart stoves. Height 12", Top 12x22", Base 12x22".

No. 242 Same with Rail.

No. 244 Galvanized Sheet Steel, fitted with two 3-quart stoves. Height 12", Top 12x22", Base 12x22".

No. 245 Same with Rail.



No. 241



**WILLIAM H. OTTO METAL GOODS CORP.**

401-417 St. Pauls Ave.

Jersey City, N. J.



Stocked in New York by TOPPING BROTHERS

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\*\*\*\*\* Quality, Not Price \*\*\*\*\*



## ANVIL BRAND TACKLE BLOCKS

A Complete line of ship's  
tackle equipment—blocks for  
manila rope, blocks for wire  
rope, sheaves, etc.

WOOD-WROUGHT  
IRON-STEEL

Be sure to specify Anvil Brand  
when placing your order for tackle  
block equipment and get the best.



# WESTERN BLOCK COMPANY

ESTABLISHED 1888

LOCKPORT, N. Y.

INCORPORATED 1890

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# Parker

## TWO CYCLE

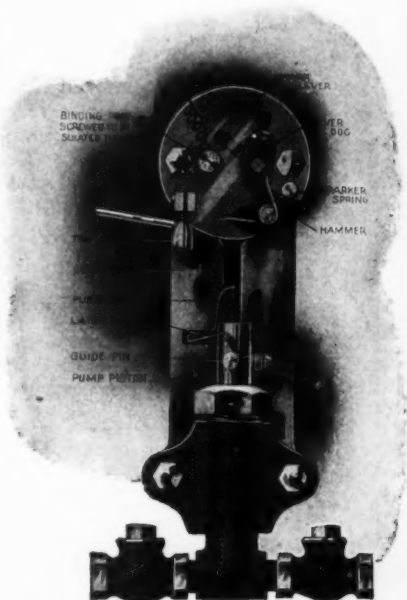
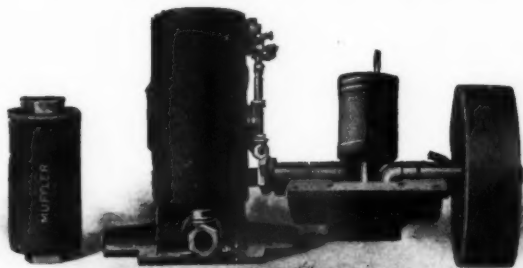
# MOTORS



SO simple a child can operate them. Barker motors were designed and then constructed for only one purpose—service. No motor has fewer parts to cause trouble. In the Barker you have a motor as near perfect as it is possible to build. Hundreds of owners testify that they have

never had a minutes trouble with their motors after many years hard use.

Type V illustrated here, shows the simplicity and construction of the Barker Motor.



The H.P. Ratings of all our motors are conservative. Brake tests have shown as high as forty per cent. above their guaranteed rating.

Manufactured by

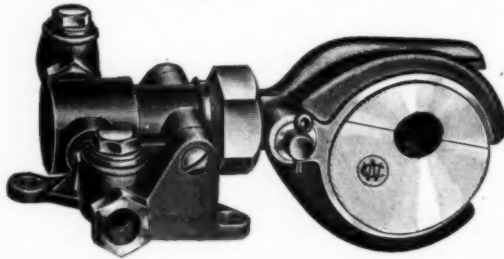
**THE BARKER FACTORY, Norwalk, Conn.**

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**TOPPING  
BROTHERS**  
122 Chambers St.  
New York City


## Let Your Engine Bail You Out



## PEQUOT POWER BILGE PUMP

**Y**OU can have a dry boat without tiresome efforts. With a Pequot Pump installed, your engine will do the work for you easily and efficiently. Pump is easily attached to the propeller shaft in the rear of the reverse gear, and operates whenever the engine is going. Disconnection is unnecessary, although it can be disconnected at will. Works in any position at right angles to the shaft. Will not cramp or bind. Strainer is furnished with each pump. All Pump parts are made of brass to avoid rust, and the entire Pump is distinguished by that high grade of workmanship and material always associated with  goods.

## Fit Out Your Boat with Marine Hardware

It pays to buy our kind. Not only will  Marine Hardware increase the usefulness of your boat, but it will increase your pleasure and safety in its operation. It will also bring you a better price for your boat when you sell.

### GET THIS USEFUL BOOK

"Sea Craft Suggestions and Supplies." Shows how to fit out your boat right. Tells what is proper Ground Tackle; gives Compass instructions, hints on Steering Gear, Shaft Bearings, Moorings, etc. Sent only on receipt of 50c.



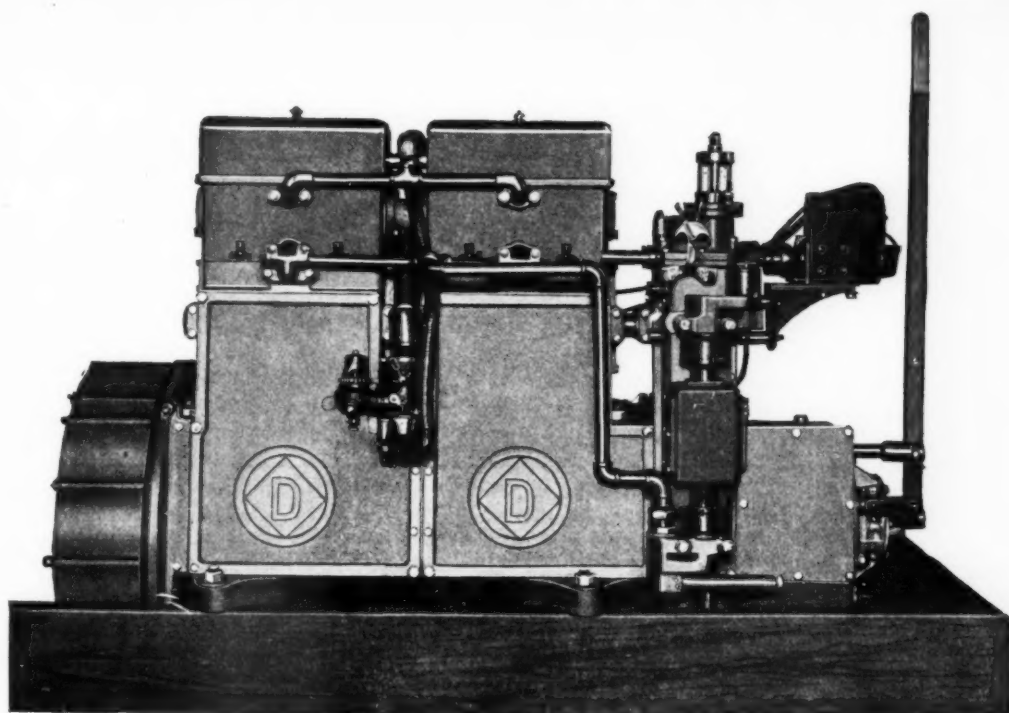
**Wilcox, Crittenden  
& Co., Inc.**  
4 South Main Street  
Middletown, Conn.



World's Largest Mfrs. of  
Marine Hardware

Mfrs. of the Famous Maxim  
Silencer for Motor Boats





## *A c c e s s i b i l i t y —*

Every working or static part of a DuPont Marine Motor is instantly accessible. The large side plates make it possible to even remove the crank shaft without taking the engine off the bed.

Write for further information.

**DU PONT MOTORS, Inc.**  
**WILMINGTON    ::    ::    ::    DEL.**

# Raising the Curtain on the New

## KERMATH FORTY

The Outstanding Feature of the 1920 Boat Show

A new Kermath of any size would be an attraction few boat owners could resist. But the first public showing of a new Kermath of twice the size and power of our largest model of the past is something to go down in marine engine history as the big development of the 1920 season.

Kermath, already the most popular marine engine on the market, standard equipment with more than sixty per cent. of all the boat builders in the world, introduces you to a new member of the family. And such an engine as it is! The newest and best features of high grade engine practice are embodied in this model. We have spared no expense or effort to make it the finest of its size and type that can be built. And our friends who have seen it and cruised with it say we have succeeded.

A full year of service in real boats, under the critical eyes of engineering experts, has made the Kermath Forty a finished product. We have withheld this announcement until the perfected engine was actually in production. Orders are now being accepted for prompt delivery.

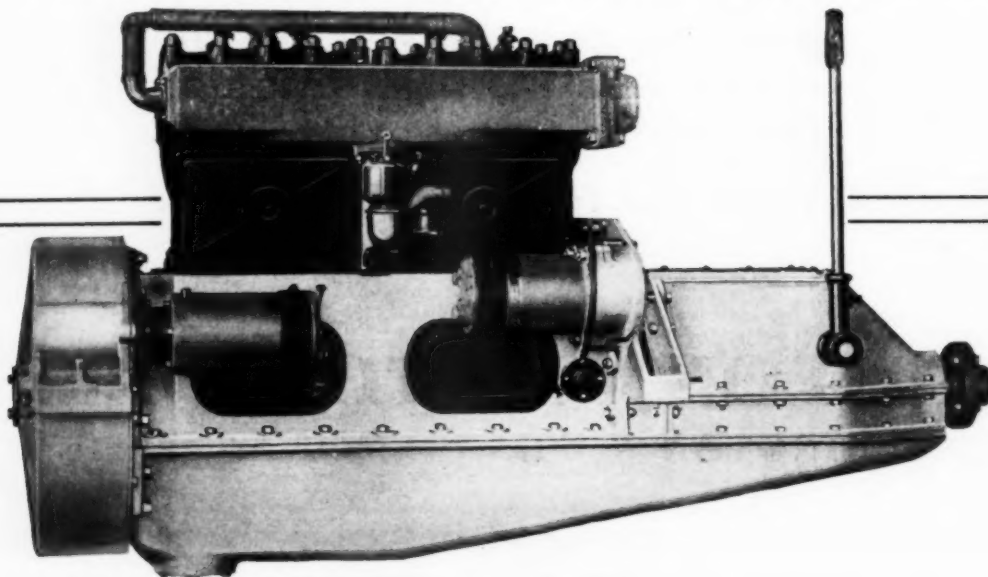
### Just Read These Specifications:

Bore .....	4 1/2
Stroke .....	6 1/2
Valve diameter, clear .....	2 1/2
Connecting rod bearing .....	2 3/4 x 2 3/4
Rear main bearing .....	2 3/4 x 2 3/4
Center main bearing .....	2 3/4 x 3 1/2
Front main bearing .....	2 3/4 x 3 1/2
Piston pin bearing .....	1 3/4 x 2 1/4
Connecting rod center to center .....	13 3/4
Camshaft diameter .....	1 1/2
Timing gears helical .....	1 1/2 face 8 pitch
Three piston rings .....	1/4 wide
Flywheel, diameter .....	20
Water inlet, diameter .....	1 1/2
Water outlet, diameter .....	1 1/2
Weight .....	1350 lbs.

Crankshaft—Chrome nickel steel, heat treated.  
Crankcase—Aluminum—very deep, rigid section.

Oil Pan and Gear Case Cover—Aluminum.  
Connecting Rods—35 Carbon steel, heat treated. Large end ground to fit bearing.  
Main and Rod Bearings—Reinforced back with Fahrig metal lining.  
Valves—Kermath Special Alloy, split washer, taper type, flat case hardened end.  
Push Rods—1 1/4-inch diameter, hollow, case hardened and ground, roller type, lock nut adjustment.  
Cylinders—Split head design. Best grade grey iron. Bored and ground to size.  
Timing Gears—30 carbon and semi-steel.  
Lubrication—Pressure feed to all main, rod and piston pin bearings. Geared oil pump, removable screen. Oil pump submerged. Oil reservoir, two gallons capacity.  
Ignition—Bosch magneto or Atwater-Kent battery system.  
Reverse Gear—Best obtainable, 100% oversize.  
Electric Starter—12-Volt Leece-Neville 2 Unit with Willard Battery.

**Price, completely equipped, \$1,500, F. O. B. Detroit**



## For High Speed or Heavy Duty

The Kermath Forty is built to "stand the gaff." It will turn up 1200 R.P.M. in a high speed cruiser or runabout, actually developing 47 H.P. at that speed. You can throttle it down to 500 R.P.M. and scarcely know its running, so smoothly and quietly does it operate.

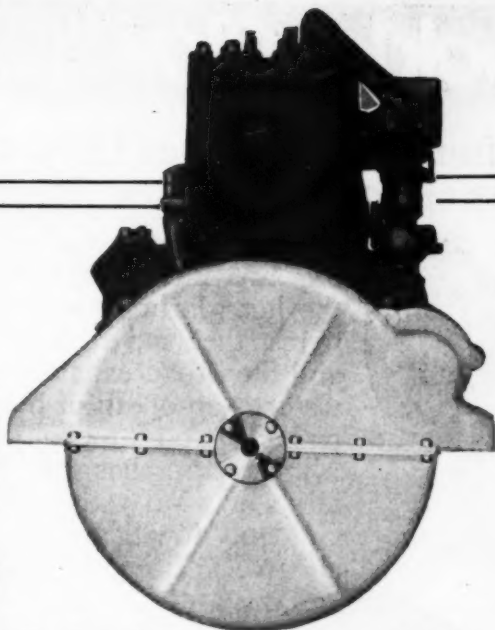
For heavy duty, it will handle heavily built work boats up to 45 feet, turning a 24 x 24 wheel at 600 R.P.M. The big, sturdy parts, liberal bearing surfaces, and force feed lubrication through drilled crankshaft, all contribute to the satisfaction you will get from this engine, no matter what service you require of it.

Don't fail to see the Kermath Forty at the first opportunity. If you are unable to examine it at the New York Show, write us for any further information you require. And if you are in the market for a power plant of about this size, this year or next, you owe it to yourself to study the Kermath Forty before you buy any engine at any price.

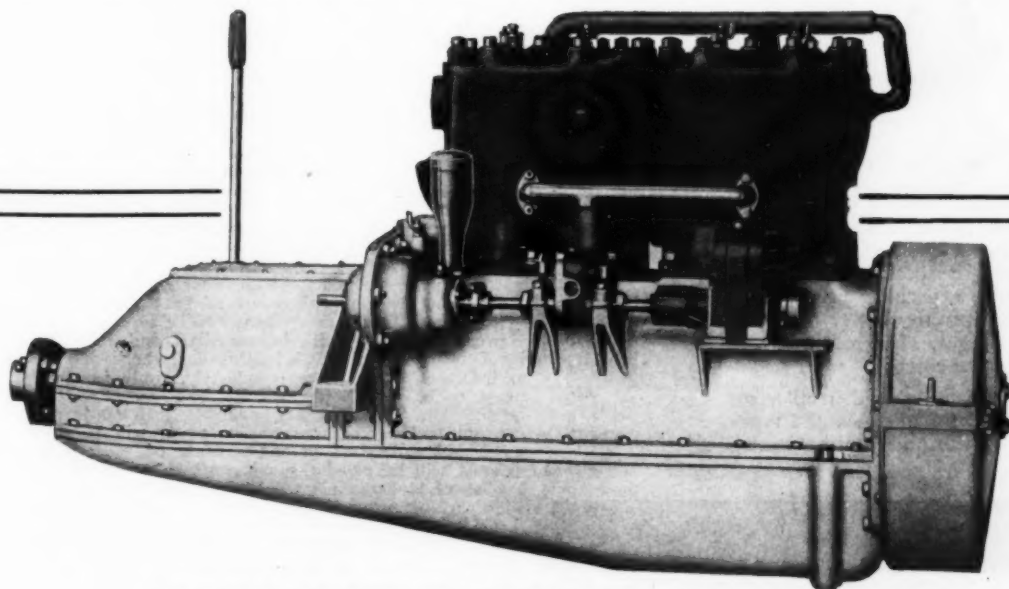
Address Department D

**KERMATH M'f'g Co.**  
**DETROIT MICHIGAN.**

*Builders of "America's Standard Four Cycle Engine"*



The Kermath Forty is entirely enclosed. Absolutely the only part you can see in operation is the pump shaft. This means a clean, quiet engine that looks as goods as it runs



*When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating*

## Golden Glow Searchlights

### When the Sun Goes Down, Boating Is At Its Best



All the joys of motor boating are intensified after the hot glaring sun goes to rest, the wind dies down and the broad expanse of water is an ocean of mystery for you to explore. Night boating has a charm all its own—if you have a Golden Glow Searchlight aboard.



The risks and uncertainty are eliminated when you have a Golden Glow to pick your way, to avoid rocks and driftwood, to find channel marks, make skillful landings and pick up your mooring in the dark. If the engine needs attention you have a powerful light at hand to help you. For bigger boats like cruisers and chasers, Golden Glow Searchlights have already

found their place. They are used extensively for this purpose.

Golden Glow Searchlights are especially suitable for boat use. Their mirror reflectors of special greenish-yellow glass give a peculiar yellow light which penetrates fog better than any other known light. The reflectors can never tarnish or corrode.

Golden Glow is produced in all sizes of searchlights for all sizes and types of boats. Write today for Catalog No. 159.



Electric Service Supplies Co.

Philadelphia  
17th and Cambridge Sts.

New York  
50 Church St.

Chicago  
Humboldt Bldg.

### Jane—A Hand 18-Footer

(Continued from page 24)

fastened in place with  $1\frac{1}{4}$  inch No. 7 oval head brass screws. Each side to be in single piece with fore end neatly and securely fastened as indicated. Edges to be neatly rounded.

Flooring: To be located at or near L. W. L., level to set on top of cross ties. Flooring to be of selected spruce strips,  $\frac{1}{2} \times 3$  inch, run fore and aft as indicated. Center section to be cleated together to be removable. Flooring in motor compartment the same with removable sections to allow of getting at parts of engine properly.

Bulkheads: Control bulkhead to be of matched chamfered mahogany,  $\frac{1}{2} \times 3$  inch, set vertically in the usual manner and backed by oak cross ties securely fastened to frames. Bulkhead to be fastened with 1 inch oval head brass screws, symmetrically arranged.

Seats: Forward seats to be of the divided type as indicated. Seats to be made up of  $7/16 \times 2$  inch mahogany strips with backboards of  $7/16$  inch mahogany. The inboard end of backboard supported by the indicated  $3/4$  inch mahogany arm. The inboard end of seats supported by two neatly turned  $1\frac{1}{4}$  inch mahogany columns. Rear seat to be made up of  $7/16 \times 2$  inch mahogany strips with backboard of  $7/16$  inch mahogany. All edges to be neatly rounded.

Hatches: To be framed as indicated and specified on plan. Cross beams to be halved into fore and aft members and securely fastened. Top to be of  $3/4$  inch spruce covered neatly with cloth like deck. Edges to be covered by flat brass strips,  $1\frac{1}{2}$  inch wide as indicated to cover seam between deck and hatches. Cleats as indicated, provided with suitable gutters to carry leak water away from motor.

Ribbands: Indicated ribband rails to be of mahogany,  $1\frac{1}{4}$  inch in half pear section fastened as indicated with screws properly let in and bunged with bungs of same material as rail. Fore and aft ends to be neatly tapered and rounded.

Woodwork in general: All parts of hull outside and all exposed surfaces inside to be carefully planed off smooth and thoroughly sandpapered to give a perfectly smooth finish. All work to be done to the satisfaction of the owner, and all details of hull woodwork are to be complete in every respect. Work not herein specified but that is shown on the drawings or is manifestly necessary to complete the boat in a workmanlike manner to be done by the builder without extra charge.

Metal work: Rudder: To be of Hand-pattern No. 460. To be hung to stern in center by two cast brass hangers drilled for stock and securely fastened through stern and stern knees, with suitable length brass stove bolts of  $\frac{1}{4}$  inch diameter. Quadrant of brass on 9 inch radius as shown, properly connected with auto steerer. There will be a thrust collar of brass to bear on upper hanger.

Sheaves: Sheaves for wheel rope to be of brass at least  $2\frac{1}{2}$  inch in diameter of the vertical type.

Stuffingbox: To be M. D. Co. Pattern K. S. bronze to fit shaft, fastened on apron with  $1\frac{1}{4}$  inch No. 14 brass screws.

Strut: To be a bronze casting of single arm type, Hand pattern, properly babbitted for shaft. To be fastened through apron with six  $5/16$  inch brass stove bolts with nuts inside and countersunk heads in plate.

Steerer: A. W. S. Hall Co. "Baby Reliance" auto steerer properly fitted on starboard side of bulkhead and connected with rudder quadrant by  $\frac{1}{4}$  inch diameter Phosphor bronze tiller rope.

Tank: Gasoline tank to be seamless, tinned steel made by Janney-Steinmetz Co. of Philadelphia, Pa., 14 inch diameter  $\times 30$  inches long, set in a suitable strong cradle as indicated. Tank to have one swash plate and a 2 inch filler plug.

Flag Staff Sockets, etc: A pair of  $3/4$  inch flush type polished brass flag staff sockets to be fitted where indicated. A pair of 3 inch brass beveled bow chocks to be fitted on forward deck where indicated, and a pair of 3 inch brass stern chocks on stern. There will be two 5 inch brass cleats on aft deck, and a 5 inch brass cleat on forward deck where indicated.

In General: All details of metal work and hardware to be complete and all parts of polished brass. All fastenings not otherwise specified to be brass screws and all inside joiner-work to be fastened with oval head brass screws.

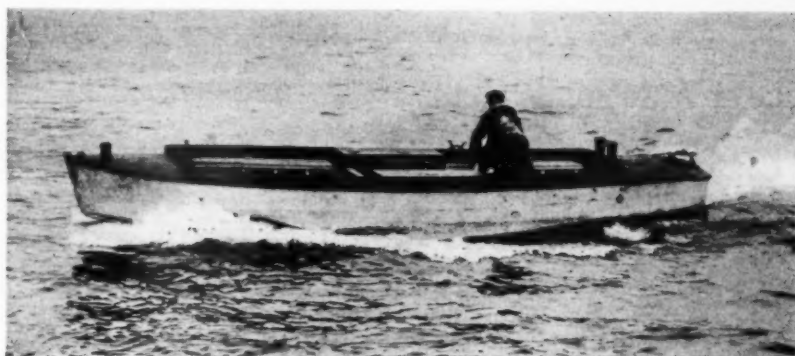
Motor and Installation: Motor to be a 20 h.p. four-cylinder Kermath  $4 \times 4$  inch with bronze shaft and 15 inch diameter by 20 inch pitch, three-blade propeller wheel. To be installed as indicated, properly and completely, ready for service. Exhaust to be piped from manifold through two  $1\frac{1}{2}$  inch 45 degree Ells,  $1\frac{1}{2}$  inch Tee, and  $1\frac{1}{2}$  inch 90-degree Ells as indicated. The discharge cooling water will be piped to Tee fitted with an extension and a drain of  $\frac{1}{2}$  inch pipe. The exhaust will be piped through a slip joint in the transom to consist of a brass plate on inside and outside of transom with packing around pipe. Gasoline to be fed to carburetor through  $\frac{1}{4}$  inch copper tubing through a Stewart vacuum tank. Builder to supply motor, all motor parts, piping, pine

(Continued on page 200)



# A Bargain for Quick Sale

## 10 New 24 Ft. Shallow-Draft Boats Powered with 25 H.P. High Grade Four Cycle Motors, at Half the Cost to Build



These boats were especially designed and built for heavy duty work, towing, etc., on shallow, fast moving rivers. The original purchaser, a foreign government, was unable to accept delivery.

The construction is unusually strong; they have a very shallow draft and the propeller is well protected by the tunnelled stern, so that they can safely withstand the roughest usage among floating logs, snags and rocks. The hull is equipped with skids which act as a protection when the boat is actually scraping bottom. The length is 24 feet and the weight of the boat and engine is 3,000 pounds, making the draft only 15 inches. This is not increased by the propeller, which is entirely within the tunnel stern hull. The shell is divided by bulkheads into four watertight compartments, any one of which might be stove in and filled with water, yet the boat would remain afloat.

The engine, which propels the boat at a speed of eight miles an hour, is a 25 H.P. high grade four cycle marine motor. It starts on gasoline but may then be run on kerosene, which reduces the cost for fuel. The kerosene is carried in two rectangular copper tanks, each of 30 gallons capacity, which assure an ample supply. The propeller and shaft are of bronze, thus preventing any deleterious effects from salt water.

These boats can be easily made thoroughly suited for pleasure purposes on all inland and coastwise waters. They were built in a first class shipyard. The motors alone are worth more than the price for which the complete outfits are offered.

Ready for immediate delivery or shipment from New York City.

Write or wire for price on one or any number. Box "D".

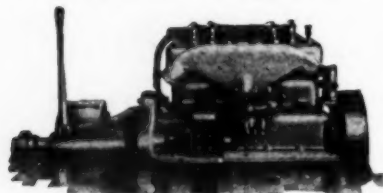
## MoToR BoatinG

119 West 40th St.,

New York

# CAILLE

## Aristocrat



### Controlled Like an Automobile Motor

With a Caille Aristocrat in your boat you can forget your motor entirely. You need never worry as to whether your motor will start promptly or remain running. It is built and controlled like an automobile motor. You have all the instruments right in front of you, mounted on the bulkhead. Starting, stopping, speed variation—all is accomplished instantly by manipulation of controlling devices at your fingers' tips.

You never have to crank the Aristocrat. It starts with pressing a button. For it has an electric starter like those on automobiles. It even furnishes electric lights for the boat. Has four cylinders and is of the four-cycle type.

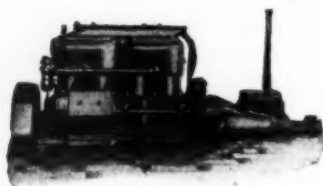
And it's the neatest, most gracefully designed motor you ever saw. Everything is fully enclosed. Nothing to catch clothing. No place where oil can splash out. It's truly the highest development ever attained in a marine motor, for the average pleasure or speed boat.

Get the details. Use the coupon. Send for catalog and prices.

### CAILLE PERFECTION MOTOR CO.

42 Caille Building

DETROIT, MICHIGAN



### USE THIS COUPON

#### CAILLE PERFECTION MOTOR CO.,

42 Caille Bldg., Detroit, Mich.

Gentlemen:

Tell me whether the Aristocrat is suited to my hull. Dimensions follow:

Length ..... Beam .....  
 Draft ..... Model .....  
 Speed desired.....m.p.h.

If the Aristocrat is not just suited to my hull—what engine do you recommend?

Name .....

Address .....

City..... State.....

### What's Her Speed?

(Continued from page 176)

distance transformed 400 gallons of the semi-precious liquid into spent gases. On the return trip when haste was no object we ran two motors at 9 knots and consumed less than 200 gallons of gas.

All this time that I have been displaying speeds of 10, 12, and 13 knots before the eyes of the reader, I have kept carefully out of his cognizance the top speed of which I believe a fully equipped chaser was capable. In order not to stretch the suspense to the breaking point, however, I may say now that never to the best of my knowledge did I cover more than 16 nautical miles in one hour on one of the Navy's "record-breaking speed craft." There were times in slipping down the back of a long green one when the rate of progress seemed twice 16 knots, but the impression was momentary and we always found another wave on the other side of the trough to arrest our flight. I do not profess to know the record of every one of the 350-odd sub-chasers, but I have been reliably informed that even on trial runs when there was none of the heavy listening equipment, armament or ammunition aboard, 19 knots was considered exceptionally fast.

When the chaser plan was first formulated it was the intention of the designer to power them with light, high-speed motors, and with these a speed much better than 20 knots was predicted. For various reasons the heavier but more reliable six-cylinder Standards were installed, and the expectations of the designer were not realized. But when all is said and written about the chasers no one can reasonably find fault with the lesser speeds which they attained. In the true sense of the word they were not chasers, but listeners, having the mission of lying in wait for submarines with their under-water antennae projected to catch the slightest vibration of a hunnish propeller. When the telltale sound was picked up they drew in their hearing devices and proceeded after the quarry. As their top speed of 16 knots was amply sufficient to place them in a position to bomb the enemy, groping his cautious way beneath the surface, why fret if our chasers didn't rise to the 28-mile expectation of the Teutons?

### Program of Races at Miami, Florida

These races will be known as the Express Cruiser Championship of the United States—and this class of racing will continue with these rules for three years.

These races will allow all classes of heavy express cruisers to enter—and by entering the outside races, the larger, heavier express cruisers will have an opportunity of winning the events even though they should lose the inside races in the bay. Some of the boats entered are too large and broad to turn the sharp corners in the bay, and this system of scoring will even matters up so that the best boat under all conditions must win.

The Express Cruiser Long Distance Races are as follows: Bimini and return, approximately 100 miles, February 14. Palm Beach and return, approximately 130 miles, February 21. Key West (one way), approximately 160 miles, February 28. Ten-mile express cruiser race on the bay course, March 5. Twenty-mile express cruiser race on the bay course, March 6.

The scoring will be as follows: One point for each boat defeated; one point for starting in the ten-mile race; two points for the twenty-mile race; three points for Bimini and return; four points for Palm Beach and return; five points for Key West.

The greatest number of starters in any race of any class will be the basis for figuring the points won in all races. For instance: If in the ten mile race there were four starters, the scoring would be four points for first, three points for second, two points for third and one point for fourth. In the Key West race the scoring in case of four starters would be twenty points for first, fifteen points for second, ten points for third, and five points for fourth.

### Specifications for 18-foot V-Bottom Runabout

(Continued from page 198)

fittings, and all labor in connection with installation. Controls to be properly connected with steerer in automobile manner.

Painting: The entire inside of hull to be painted with DeVoe's D tank deck paint or equal. Outside, below bilge line, to be painted with one coat of red lead and oil and two coats of Sherwin Williams Corinthian green bottom paint, or equal. Topsides to be painted with four coats of white lead, mixed with lamp black in sufficient quantity to give a slate gray color. Decking to be painted with three coats of DeVoe's D tan deck paint, or equal. Bulkheads, seats, flooring, curbs, ribbands and all other parts of hull, to be finished with one coat of wood filler and three coats of best marine spar varnish.



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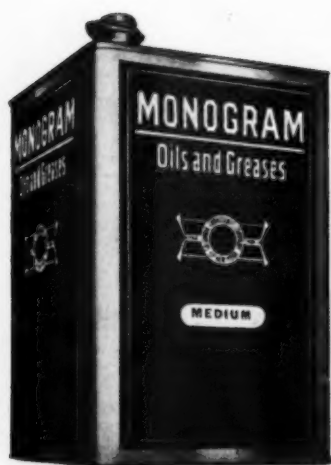
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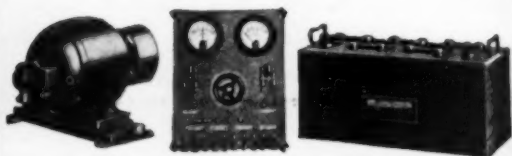
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## Solving the Problem of Handicapping

(Continued from page 44)

yacht clubs, that the A.P.B.A. rules cannot be juggled in this manner; but between boats owned within one club some method has to be devised by which all the boats can race somewhat equitably, as otherwise the interest in motor boating and especially in the racing events will lag and die out. One "rule-beater" in a club fleet, if continually allowed to race under A.P.B.A. rules will drive all the other boat-owning members to desert the yachting events held by the club. In a regatta recently held by a very prominent yacht club under A.P.B.A. rules, only two boats owned in the club entered, and the event would have been a failure had it not been for some ten or twelve boats from other clubs taking part.

Such a craft as I have shown Boat No. 1 to be is an unusual boat, and for a season she can enter in racing events and carry away the prizes, but if this continues owners who know her rating as compared to her speed, will refuse to enter against her, and this is detrimental to motor boat racing generally. For the good of the sport and upon the principle that she has attained glory enough, such a craft has to retire from the racing game after a season or two; and, unless some provision is made by which race committees can determine the rating at which she shall be allowed to compete, her career as a "rule-beater" is at an end. Rule IX, par. 4 of the A.P.B.A. rules provides that race committees may decline any entry, but I do not consider this is adequate to cover such a situation as I have described.

For club racing I advocate races both under strictly A.P.B.A. rules and also under performance handicaps, and when the latter are the conditions the formula which I have endeavored to make clear enables each boat to take a rating for the purpose based upon speed performance and the regular A.P.B.A. Table of Allowances can then be used in the usual manner. It is necessary to mention that under this formula all boats racing must be rated by the formula, as otherwise, should one boat be entered at her A.P.B.A. measurement rating, she would either have an advantage or a disadvantage over other boats rated by the formula in the same proportion as her actual speed is over or under 90% of her theoretical speed.

It is necessary that race committees keep full and careful records of every boat in the fleet in order to have available data for use in racing events. This entails much labor and considerable time, but the results fully compensate. Records are invaluable in that they furnish data upon both performance and A.P.B.A. racing. The motor, bore, stroke, revolutions and all hull measurements should be carefully tabulated, and the actual speed records of every event in which the boat participates should be kept. From these the percentage of actual speed to theoretical speed should be figured and recorded, and any particulars should be noted which would bear upon the showing in any particular race. The writer makes such notes as these for his future reference and finds them valuable: "Won slowed up," "Had bent propeller blade," "Was confidentially informed that revolutions increased," etc., etc.

With my experience in racing motor boats, I find it hard to believe that any craft can show actual speed up to 100% of the theoretical speed, and when a boat approaches such percentage I am always suspicious and always upon the alert to prove the correctness of her rating. In many cases I have been enabled to detect errors in this way, and have had ratings corrected upon remeasurement. When the actual speed of a boat exceeds 90% of theoretical speed she becomes above the average, and as the percentage climbs toward the 100% mark the more wonderful she becomes and the more honor due her designers. The racing life of such a boat is naturally short as, after a few races, she is looked upon as unbeatable at her rating, and other owners refuse to enter their craft against her. This puts the "rule-beater" out of the game, and keeps racing events from filling, and is a detriment to motor boat racing generally. The only remedy is to allow the "rule-beaters" to enter and race, but put upon them a rating which equalizes them with the ordinary craft.

Before closing this article, I want to make it plain that I am treating the matter solely from a view point of club racing, and as the majority of boats found in the club fleets are of the cruising class as defined in the A.P.B.A. rules, it is with these boats that I have used the formula for performance handicapping under A.P.B.A. Table of Allowances. I have not attempted to apply this formula to what are termed express cruisers or to speed boats. If I can secure enough data upon such boats to make it possible to apply the formula to them I shall certainly do so, and I see no reason why it should not work out equally successful.

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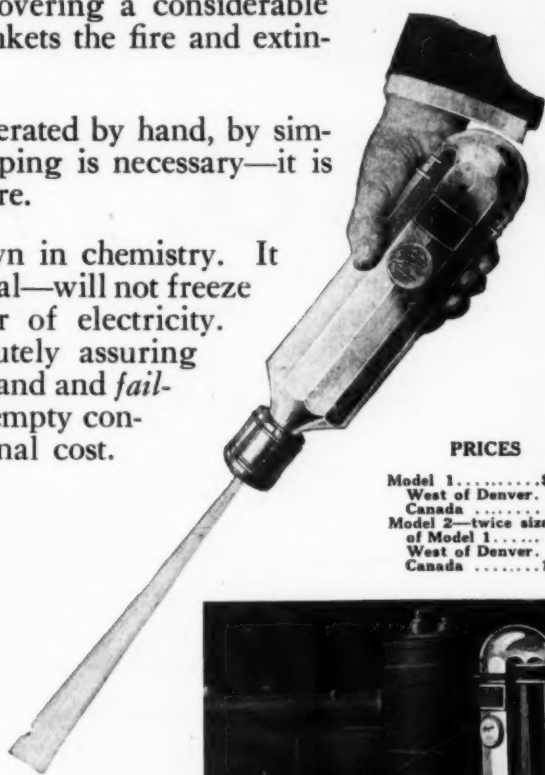
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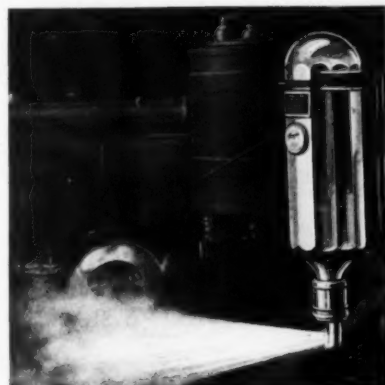
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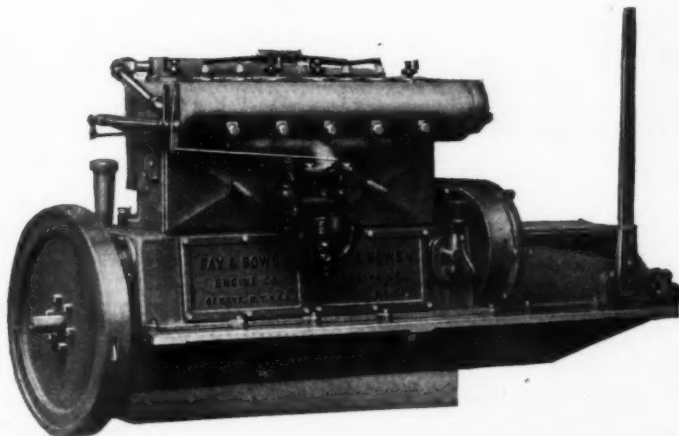
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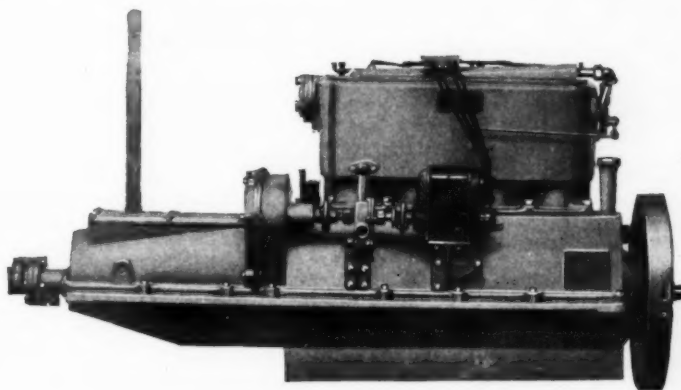
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

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

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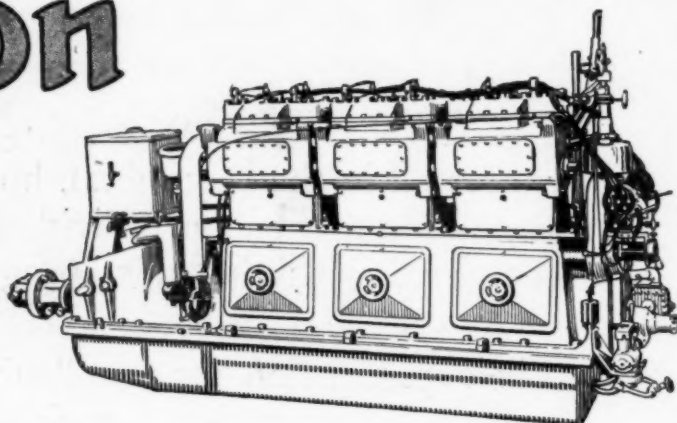


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